GRUMMAN plane news

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Name Buxton, Satterfield as V.P.s in Grumman Aerospace

John M. (Jack) Buxton and L. M. (Butch) Satterfield were elected vice presidents of Grumman Aerospace on Wednesday, February 16, at a regular meeting of the Board of Directors.

Jack Buxton, who is based in Houston and is regional director of Grumman operations in that area, has spent most of his 31 years with the Company away from Bethpage, "home" of Grumman Aerospace corporate headquarters. Most of his service has been in direct contact with the customer, first with the Navy and the Marines, and now with the National Aeronautics and Space Administration.

After joining Grumman in 1940, Jack was in Inspection for a couple of years, then, early in 1942, he began his nearly 30-year stay in the field. During World War II Buxton was assigned to the Pacific and carrier duty as a Field Service representative. After the Okinawan campaign and VJ Day, Jack got his first look at China, visiting Peking in September 1945 with the U.S. Fleet.

Following the war, Buxton was assigned to Norfolk, Va., home base for the Commander of Naval Air Forces, Atlantic, where he also did double duty as liaison representative to the Bureau of Aeronautics in Washington, D.C. It was during this period, while supplying liaison on the A-2F and W-2F (now A-6A and E-2A, respectively) that Jack and others within the Field Service Department began to establish the total logistics support concept for Grumman.

Heads Houston effort

About 1957, Jack moved to full-time duties in the Washington, D.C. office, and early in 1962, while Grumman was making its bid to build the Lunar Module, Buxton was assigned to the Manned Spacecraft Center at Houston. With Buxton as manager, then director, the Houston operation grew from a one-man office to an organization of more than 400 engineers and technicians. Perhaps the high note of the era, for Buxton and the space program, was the first manned thermal vacuum test of LTA (Lunar Module Test Article) 8 —a vital and giant step along the way to the first manned landing on the moon.

Jack Buxton

Butch Satterfield

Under Buxton, the Houston operation has helped to spin off some space technology into another key area—medical research. Over the last several years, Grumman engineers there have designed and produced several pieces of advanced medical equipment, including a live organ transporter and a mobile intensive-care operating table (MICOT).

Although still actively engaged in the Lunar Module Program, Jack is directing much of his energies these days to helping Grumamn win the NASA Space Shuttle competition.

Buxton doesn't spend much time getting to work—he lives with his wife Vickie and 18-year-old son Mark in Nassau Bay, practically across the street from the Manned Spacecraft Center in Houston.

Butch Satterfield brings more than 30 years of management and aeronautical experience to his new vice presidential post. A native of Texas, Satterfield earned a B.S. degree in chemistry from Trinity University in 1940, and has done graduate work in aeronautical engineering at the U.S. Naval War College and the California Institute of Technology, and in military and political science at the Naval War College and National War College.

After retiring with 24 years' service in the Navy as Captain in 1965, he came to Grumman as a vice presidential staff

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KSC team picking up pace on LM in preparation for Apollo 16 flight

KENNEDY SPACE CENTER, FLA.—It was on February 9 that the Apollo 16 space vehicle was carried slowly and carefully by the crawler transporter to resume its position on launch pad 39 at Merritt Island, where on April 16, it is scheduled to lift off on a journey to the moon.

The Lunar Module, with mission commander John Young of the Navy and LM pilot Charlie Duke of the Air Force aboard, is to touch down in an area of the moon called Descartes at 3:41 p.m. (EST) Thursday, April 20. Splashdown in the Pacific is to be at 3:30 p.m. on April 28.

Those are the bare bones. The flesh will come. Indeed, part of it is there now and the KSC Grumman crew is checking out LM 11. Things are moving smoothly, back on the DLO (Director of Launch Operations) schedule.

In fact, unless something unusual has occurred after press time, the flight readiness test will have been accomplished and C2F2 (Crew Compartment Fit and Functional) is now under way. In the immediate future are: start of Propulsion System Leak and Functional tests, March 2; NASA Flight Readiness Review, March 9; preparation for hypergolic servicing, March 10; and a critical period from March 13 through 17 when the hypergolic propellants are loaded. Then, countdown demonstration — just (as always) to make sure — before the actual countdown is to start April 10.

So these are even more-than-usual active days for Grummanites at KCS, where active days are always the rule. There's no let up.

This upcoming lunar mission, like those before it, has new wrinkles, new experiments. For example, there'll be a far-ultra-violet camera aboard, and a cosmic ray detector. The camera's role is to shoot ultra-violet pictures of earth and the moon for use in the study of planetary atmospheres and for the investigation of short wave length fluorescence from the lunar surface.

The cosmic ray detector is to get data on the rays and information on charged mass and energy spectrum of solar wind particles (a form of radiation).

As before, too, this set of EVAs (Extra-Vehicular Activities) will run longer than any preceding moon walks (and rides). While Command Module Pilot Ken Mattingly is in lunar orbit, the two astronauts on the lunar surface are to have three EVAs not to exceed 73 hours; and they'll have the convenience of the LRV (Lunar Roving Vehicle).

Navy makes $9.8 million award for A-6E long lead-time items

Grumman has been awarded a long-lead time contract of $9,800,000 for modifying the all-weather attack A-6A to become an A-6E. Total amount of the initial contract will be $73 million, with 36 aircraft during 1973.

After that, the modification rate will be four aircraft per month. The potential for modification could be 192 aircraft for $300 million, assuming 48 aircraft in '74 through '76 and 12 Intruders in '77, says Mickey Hutter, A-6 Business Development representative.

Major changes have been made in the attack/navigation system so as to improve reliability and maintainability. The new subsystems include a simultaneous, multi-mode radar, a solid state digital computer, a solid-state interface unit, and a more versatile and consolidated armament control unit. These feature miniaturized components with built-in test and fault-isolation procedures, which insure rapid turn-around of aircraft — meaning increased availability.

Overall, the A-6E has achieved the objectives of substantial improvements in reliability/maintainability, and has gained greater weapon delivery accuracy due to faster data processing and more precise data transfer. The A-6E aircraft has done very well in evaluations by the Navy BIS (Board of Inspection and Survey) team, says Hutter, and production aircraft are being delivered to Fleet squadrons.

(Photos by Fred Annette)

Dick Hutton looks back, says: 'Heart in Preliminary Design'

He was using a felt-tip pen to tamp down the tobacco in his corncob. "It looks like the same pipe you've been smoking for the past I-don't-know-how-many years," commented a friend. "It is. I smoke matches," responded Senior Vice President Dick Hutton with his characteristic, warm smile. "They taste better than lighter fluid."

Dick Hutton is getting ready to retire after 41 years in aircraft designing. On March 1 he'll turn in Badge No. 21 and start finding out what it feels like to drink the morning coffee at home. These many years he's had his coffee and doughnuts at his desk—would you believe at 7 a.m.? It's a strong habit to break. But he's going to try.

"Marian and I like to travel, and we're going to Europe in late spring," he said. "And then when we get back we're going sailing on the boat for the rest of the summer. Next winter we hope to take the boat to the Bahamas. And after that we're not making any plans. For the immediate future, they'd like me to be on call here to help, perhaps, with the Space Shuttle proposal. . . ."

Hutton's low-keyed approach to most subjects belies the drive and originality that have characterized his whole career in aircraft design. In a recent conversation on his Grumman engineering career, the closest he would come to taking some credit for an engineering design was to say that the F8F Bearcat was "perhaps the airplane I liked best." Even in that discussion, the pronoun was usually "we" and not "I."

'Hot rod' his favorite

The plane was designed during World War II but was too late—"a victim of history," to quote Hutton.

"It never became a combat airplane. But it was a real hot-rod. A real performance aircraft. If you notice, it's still winning air races even today. The Blue Angels flew it for a while. I guess we built about a hundred. We built the most power into the smallest plane we could. Oh, I guess the initial layout was mine, but everybody was in there."

A review, by number designation ("I always think of the airplanes by number rather than name"), of products worked on by Grumman reminds Hutton that the time has gone quickly and pleasantly during these 41 years "and how important it is that you enjoy your work! Pay, hours, how busy you are—these aren't important if you like what you're doing. And this has a lot to do with the people you're working for. Bill Schwendler—he's the one who made it happy for me. Quiet, reserved, never one to make speeches—yet without a guy like him, there wouldn't have been a Grumman Company. Each person has his part."

Asked about his early days in the business, Hutton replayed it something like this:

He started with the Loening Aeronautical Engineering Corporation in the shop at the age of 18. "But I always had it in the back of my mind that I wanted to be an engineer." After Loening sold out to Keystone, in 1929, he worked in New York for a while, and then in the fall of 1930, an opening turned up with the 11-month-old Grumman Aircraft Engineering Corporation "and I took it. I knew the men from Loening, and I guess I made them aware that I was anxious to work into an engineering job. In the shop I worked with Ed Weick and Julie Holpit daytimes, and I was going to Pratt at night taking engineering courses. I'm really not sure how I got transferred, but I think it might have been through Charlie Tilgner's influence. He'd been teaching evening school at Pratt and knew me there.

"Charlie was one of a handful of engineers in the new company at Baldwin. Tom Rae, Charlie Niles were there. Bill Schwendler was Chief Engineer, designer, everything else. It developed that he'd say, 'Draw it up for me.' I was the new guy. 'Dick, do this, do that.' I liked new stuff. I like innovative work, and I could respond to him, follow through the initial thought. Working this way, you learn a lot of characteristics of the man; develop ability—get to know what he means. He gets the right responses. It's an example of rapport built up between two people. And that's the way people work together now; I've had young men who could respond to me like that. Mike Pelehach was one of them. You're not aware when this sort of thing is happening. It just works that way.

'Just seem to grow'

"My heart was always in the Preliminary Design phase," Hutton continued, "and I was happy when someone else was chosen to carry on and fully develop new projects. Some of those who had this desire to follow through included Pete Erlandsen in missiles, Ralston Stalb with amphibians, Scotty (Walter Scott) and Joe Gavin in space. Sully (Leonard Sullivan) picked up from me in aircraft. You see that happening a lot around here—things don't really get planned; they just seem to grow. I think that's good. Of course these areas grow because of the strength behind them, the willingness of Management to go along."

"What do you see for young people in the future?" Hutton was asked. "For example, do you agree with Senior Vice President Grant Hedrick that it would be healthy for the industry to have more young engineers taking general courses rather than specializing?"

Hutton picked it right up. "Yes—and it must be so; I can't remember when Grant's been wrong about anything."

Under today's long hair and beards Hutton sees "the same nice kids," but finds a gap in communication between them and their elders. He likes to quote some words of Eric Walker, former President of Pennsylvania State University, on the giving of his charge to Penn State graduates in 1969: "Your parents and grandparents are the people who within just five decades, 1919-1969—have by their work increased your life expectancy by approximately 50 percent—who while cutting the working day by a third, have more than doubled per capita output. . . . Because they gave you the best, you are the tallest, healthiest, brightest, and probably best looking generation to inhabit the land. . . ."

And because these of the elder generation were materialistic, "you will work fewer hours, learn more, have more leisure time, travel to more distant places. . . . If your generation can make as much progress in as many areas as these two generations have, you should be able to solve a good many of the world's remaining ills."

Reviewing the airplanes that Grumman has built over his span with the Company, Hutton was reminded of a trip he and John Karanik made to England shortly after the end of World War II, to look into the possibility of using Rolls-Royce jet engines for Grumman's first jet airplane, the XF9F-2 Panther.

"There were strikes in shipping and the airlines, too," he recalls, "and we were lucky to get on the Queen Mary (still a troop ship) on her last trip. She made record speed. A month later we were still the victims of the strike and though we got priority for return by air, we were on call and tied to our hotel room for a week. One of us had to stay in while the other went sightseeing and called in every two hours. It was dismally cold, and John remembers that the food was dismal too: 'powdered eggs, Brussels sprouts.'"

'Methodical, probing'

Hutton has made of speech-making a pleasant experience, whether to Grumman's engineering scholars or the Grumman stockholders attending an annual meeting. He gathers information for the stockholder speech and puts it all together himself. Says one who is familiar with his pattern of work: "He is so methodical, so probing. If something needs bolts, he has to know that they fit, and if they don't, why they don't, and he'll follow that problem, if it is a problem, right to the drawing board. And yet he can turn over all the executive responsibility for a new aircraft to one

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In capsule

Dick Hutton, Permanent Number 21, started with Grumman in the shop in Baldwin in November 1930 and went to school at night to study engineering at Pratt. He became a project engineer and development engineer, and in 1940 was named chief development engineer.

In 1955 he was named Chief Engineer, and Vice President in charge of Engineering in 1959. He became Senior Vice President - Technical in 1963. He is a Director of Grumman Aerospace Corporation.

Dick received the Lawrence Sperry Award from the Institute of Aeronautical Sciences "for outstanding contributions to the development of carrier-based aircraft."

He teaches weather courses for power boat squadrons. Is married to the former Marian Trueblood, and they live in Huntington. They have two daughters and two granddaughters.

See bigger dollar return in realignment of Procurement

With 50 percent or more of the sales dollar earned by the Company flowing out to associate contractors for services and systems, equipment and supplies, the area of Procurement Management has become a vastly important one for Grumman. When Procurement Management was established, about a year ago, and Dave Lang was named to head it, John O'Brien, Administrative Vice President, explained its importance this way: "The purpose of Procurement Management is to increase the total management effectiveness of our procurement of material, systems, structures, and services, and to insure proper emphasis on the efficient handling of the property acquired by the Company in the performance of our contracts."

Lang has just announced the establishment of a new department, Procurement Operations. It includes all program procurement activities, Central Purchasing, and appropriate procurement staff offices, thereby consolidating total procurement responsibility within one organization. Bill Paxson is the director. "Our thought is to have an identifiable operation to which all suppliers can quickly and directly relate," Lang said last week.

"Bill Paxson has the desirable extensive Management Operations experience, as well as particularized procurement expertise with the subcontractors and suppliers of our programs. I expect him to continue to develop policies and practices that will be fair and equitable for our suppliers and a benefit to Grumman and the major Grumman customers," Lang added.

Expensive commitments

Another new department, Inventory Management, is also established with Al Schuckle as director. Inventory Management includes material planning, inventory control, distribution, and related activities. As Lang points out, "We are recognizing that once we receive equipment, materials, supplies in-house, these must be accounted for, tracked, reordered when necessary, and treated like the expensive and extensive dollar commitments they are. How we take care of them is an important element in the success of the Company's operations. Procured materials represent more than 50 percent of the total dollar expenditures on major programs."

Property Management, with Art Frank as director, has been expanded to include responsibility for Central Property Disposal activities, making central property disposal a part of Property Management.

"This area is governed by regulation and it requires many actions subject to surveillance by the Government," Lang explained. "Good business practice assures maximum possible return on materials we dispose of as surplus. (Some are reused by other Government agencies or by educational institutions—or sold in the marketplace.). We shall want to maximize the benefits from disposal of excess property, and Art Frank has the substantial property management experience. His growing department is intimately familiar with Government properties operations and control. With Charlie Gemuendt's assistance, I expect they will substantially improve the coordination of, and return from, our disposal activities—materials, equipment, and supplies."

Tom Fessenden, director of the Computing Management Department, helps provide the interface between Grumman Aerospace Corporation and Grumman Data Systems Corporation. The department is responsible for the control of all business and technical matters related to the fulfilling of GAC's computing service requirements, from Grumman Data Systems or from other suppliers.

"Our staff operations are program oriented," Lang points out. "By this new alignment, we can serve the Company and its operating components more effectively, improving Company profits—and that, as we see it, is a very desirable goal for a newly expanded operation."

Since joining Grumman nearly six years ago, Bill Paxson has moved from deputy director of Material in charge of Subcontracts to Material manager - LM, and from there to Material manager on all space programs, including LM, OAO, AAP, Special Projects. He became director, Subcontract Management, for all programs and about January 1, director of Procurement Operations, which includes all the Program Procurement Organizations, Central Purchasing, and appropriate Procurement staff offices. Paxson was formerly Vice President for Operations with General Instrument. He is in Plant 5, on Ext. 3171.

Al Schuckle has a background of 23 years in Planning, with supervisory slots in Sheet Metal, Electrical, Spares Requirements, and Scheduling. He was manager of Procurement Planning, '63-66, and then deputy director of Material Planning Control, 1966 to January of '72. He joined the Company in 1941, starting in the shop, where he spent four years before going to Planning. He also served in the Marine Corps for four years. Al is in Plant 30, on Ext. 3270.

Art Frank started in Engineering in 1938, and from 1941 to '52 was project engineer successively on the TBF-1, AF-2W/2S, S2F-1, TF-1. In '52 he became chief project engineer, in '59, assistant director of Contracts. In 1965 he moved to Product Manufacturing and special assistant to Vice President Ed Nezbeda. Then he was deputy director of Manufacturing for three years, and in '69, he, with Al Mead, established the framework of laboratories consolidation and implemented the Property Management function. He became Property Management director about a year ago. His office is in Plant 30, Ext. 3616.

From the end of 1966 to January of '70 when he was named director of Computing Management, Tom Fessenden was director of Engineering Services & Administration, responsible for the development of long-range plans for the Engineering Department. He joined Grumman in 1952 as a Research engineer and was in that group for five years. He then became Weapons System analyst, group head in Advanced Development, and group head in Systems Analysis, 1957-1960. From 1960 to 1965, Fessenden was assistant section chief, Systems Analysis & Integration. He participated in selection and acquisition of personnel for the LM Program, was on the TFX missile proposal, and was made responsible for the Systems Engineering Analysis Report (SEA). In 1965-66 he was section chief, Systems Analysis & Integration. His present base is in Plant 5, Ext. 3620.

Expanded responsibilities. Dave Lang (C), director of Procurement Management, welcomes key members of his organization to a Procurement Management staff review (L to R): Bill Paxson, director, Procurement Operations; Tom Fessenden, director, Computing Management; Art Frank, director, Property Management; Al Schuckle, director, Inventory Management. (Photo by Fred Annette)

Hutton . . .

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man, as he did with Mike Pelehach for the F-14."

Hutton's friends had a modest party for him at Huntington Town House last week, and even that may have been more of a splurge than he himself would choose. "He likes people in small numbers. Hold a committee meeting of more than six and he tends to grow restless," says one who has known him for a long time. "For a man who's had such an impact on the whole history of Grumman, it's surprising how he's kept himself out of the spotlight. And that's the way he likes it. He's done a mighty work, and he can have very few regrets. An honest, straightforward, talented, considerate guy. The Company won't be the same without him."

Keep tuned in, storm season not over yet

In the event of severe snowstorms or other emergencies, information concerning plant closings will be available by dialing either of two Grumman telephone numbers or will be carried on local radio stations.

Call LR 5-5111 in Bethpage or PA 7-1504 in Calverton, beginning at 5 a.m.

The radio stations carrying plant closing information, beginning at 5 a.m., are: WMCA - 570; WOR - 710; WHN - 1050; WBAB - 1440; WNBC - 660; WABC - 770; WGBB - 1240; WTHE - 1520.

If your license plate number is on file, Plant Protection can let you know if you have left your lights on, have left your engine running, have a flat tire, or need to move your car for snow removal.

Report net loss of $17.9 million

BETHPAGE, N.Y.—Grumamn Corporation reported on Wednesday, February 16, the followiing final audited results for the twelve months ended December 31, 1971: Consolidated Sales and Other Income—$800,739,148; Consolidated Net Loss — $17,989,580, equal to $2.58 per share after Federal Income Tax credits of $18,200,000.

These fnal figures for 1971 reflect the previously reported estimated loss of $65,000,000, before tax adjustments, by Grumman Aerospace Corporation in the work now required by its contract for flight development work and the first 86 F-14A Tomcat aircraft. The loss is being reflected on the Company's fnancial statements by a write-down of F-14A inventories to realizable values. Grumman Aerospace is a wholly-owned subsidiary of Grumman Corporation.

Corresponding figures for the twelve months ended December 31, 1970 were: Sales and Other Income — $995,410,054; Net Income—$20,271,704, equal to $2.90 per share after provision for $17,500,000 for Federal Income Taxes. Fully diluted Net Income was $2.62 per share. The loss and earnings per share were based on the average number of outstanding common shares during each year and included common stock equivalents for 1970.

CALENDAR of events

Notice of events for period March 10 - March 24 should reach Plane News by Tues., Feb. 29.

Am. Radio Club: Wed., March 15, 5 p.m., WA2LQO radio shack on roof of Plt. 5, bus. & oper. mtg. Emmett Goodman, Ext. 87125.

Chess Club: Tues., 5 p.m., Plt. 3 Cafe, tournament, games. Alex Ikonnikow, Ext. 7592.

Coin Club: Every Wed., 12:05 p.m., Plt. 25 Vendor Conf. Rm. Ken Hale, Ext. 3395.

Duplicate Bridge Club: Every Thurs., 5:45 p.m., Plt. 3 Cafe. S. Stone, Ext. 3652.

Ex-Servicemen's Club: Wed., March 1, 7:30 p.m., Plt. 28 Audit., reg. month. meet.; Vet's counselor avail. 3/2, Ext. 2814. Al Kordulla, Ext. 87259.

Family Campers: Sun., March 5, 5 p.m., Plt. 18, gen'l. mtg. Bill Lord, Ext. 2914.

Fenc. Club: Mon., 5-7 p.m., Plt. 30 Cafe, instruction in fenc./competition. A Chomas Ext. 1926.

Flying Club: Fri., March 10, 5 p.m., Plt. 28 Audit., reg. mtg. Stan Kalemaris, Ext. 7341.

Old Friends Club: Tues., Feb. 29, Hearthstone Inn, Rte. 109, month. mtg., & dinner. Frank Mistretta, Ext. 2683.

Ski Club: Wed., March 1, 8 p.m., Holiday Manor, Hicksville Rd., Bethpage. Bill Flynn, Ext. 1823.

Stamp Club (Bethpage): First 3 Wed. of ea. month, 5 p.m., Plt. 30 Cafe, swap, circuit bks., sales, auctions, discussion. Marty Harow, Ext. 9171.

Soc. of Logistics Engrs.: Tues., March 14, 5:30 p.m., Old Country Manor, 244 Old Country Rd., Hicksville, L.I. Chap., cocktail/dinner mtg. Col. E. R. Fallon, USAF, on "Real Issues of Logistic Support." Jack Beiderman, Ext. 2091.

About the ads . . .

Soon will come the spring, and the classified ads in Plane News will reflect the housecleaning and garage-straightening that takes place after winter has begun to take its leave. If you want to use the classifieds, you will need "At Your Service" form No. 1956, available at ESO, Corporate Services counters, or the Plane News office, Plant 5 Mezzanine.

More tests coming up for TACRV

(Photo by John Boles)

"We've just finished the ground vibration survey for the TACRV (Tracked Air Cushion Research Vehicle). No unusual structural vibrations were encountered," says Product Manufacturing Program Manager Jim Koschara, Plant 4. "Now we're preparing to place the vehicle on a transportation dolly to take it outside on the concrete area facing Plant 5 where we'll run fuel calibration and basic single-engine tests."

TACRV's next adventure comes at the end of this month when it will go through levitation and cross-wind tests. The 60 mph cross-wind testing will be done by a Gulfstream I, placed at a 45-degree angle to the vehicle. The purpose is to measure the cross-wind effects on the vehicle's engines.

Nearly complete

The hardware phase of the program was begun in March of last year and will be completed next month. The research vehicle, built for the U.S. Department of Transportation, is designed to travel in a guideway at speeds up to 300 mph between such cities as Boston and New York or Washington and New York. The vehicle will literally ride levitationally, on a "cushion" of air.

The Department of Transportation will put the tracked air cushion vehicle through 18 months of further testing at its test site at Pueblo, Colo.

"One of the things that pleases me most," says Koschara, "is that we've run the program well within budgetary limits. And frankly, that couldn't have been done without a lot of skilled, hard-working people. They've been great."

Calling applicants for Masters Fellowships

If you have creative design experience and are anxious to expand this talent, you may qualify for a Grumman Engineering Masters Fellowship. The Company offers about a dozen Fellowships each year to provide qualified people with a strong interest in the design aspects of engineering further opportunity to enhance their professional design skills. There has been a change for 1972, allowing potential Fellows to apply themselves rather than limiting Fellows to only those submitted by their supervisors.

To qualify for selection, however, an applicant must first meet the following requirements:

- Bachelor's degreee in an engineering field related to aerospace
- Minimum of one year's experience with Grumman by summer of '72
- Demonstrated capability at Grumman to perform creative design work
- Admission requirements enrolling in a graduate engineering program at a local university

Those selected for the Fellowship Program are required to carry an academic program that will allow graduation in two years with a Masters Degree in engineering. So that an individual may meet the heavy study load of a Fellow, each person selected for the program is required to work only 24 hours each week. Fellows receive 60 percent of their salary throughout the academic year, and return to a full 40-hour work week with commensurate pay during the summer.

Yearly stipend

Each Fellowship is granted for a one-year period and is renewable for the second year upon satisfactory completion of the first year's studies. The Grumman Engineering Masters Fellowship provides:

- Full tuition, books, and fees
- Yearly stipend of $1,000
- $500 additional for each dependent (spouse and children)
- Rotational work assignments

Rotational work assignments during the two-year study period provide a design engineer with the opportunity to acquire broader industrial experience in areas mutually beneficial to both the individual and Grumman.

Members of the Fellowship Recommendation Committee are: Dick Cyphers, Dick Imgram, Dick Scheuing, Dick Mazourek, Dick Sanchez, Ray Doll, and Don Spetta.

Final selection is made by the Fellowship Committee: Board Chairman Lew Evans, President Bill Zarkowsky, Senior Vice President Grant Hedrick, and Vice President George Skurla.

If you feel you qualify for the Fellowship Program, you may apply by visiting the Fellowship Office in Plant 35, or by calling the office, Ext. 9457.

TV series

A provocative six-part series on people of various ethnic backgrounds who are in the cultural and performing arts will start at 9 p.m. February 29 on Channel 21. Each program will feature an artist or a group of artists. The initial show is on Greek-born artist "George Koras, Sculptor: His Head, His Work, and His Heart." It is produced by L.I. Educationall Television Council, Inc.

Lockwood makes it a habit; his timely idea earns $1,000

Here's a different angle on a Corporate Suggestion. It's so fundamentally useful to all aircraft, and the F-14 in particular, that Grumman has applied for a patent.

The idea was originated by Harold Lockwood, Hydraulics leadman, Plant 2, and for it the Corporate Suggestion Awards Committee presented him with $1,000 in Savings Bonds.

Big awards are nothing new to Lockwood. In 1955 he won $200 on an invention and then $1,000 on it when re-evaluation time came around. In 1959 he got $300 for another idea plus $1,250 upon re-evaluation. With another $50 award in 1960 and last month's $1,000, his Corporate Suggestion earnings thus far total $3,800.

Lockwood's invention solved a problem that developed with a titanium fitting on the F-14. The way he explains it, the method of proof-testing and prestressing stainless steel and titanium hydraulic lines had been to leave an additional two inches of tubing on a production line, deburr, flare, inspect, and install cap fittings in preparation for pressure test. The lines then had to be rerounted to have the fittings removed and to cut off the two inches of excess material, scribe, deburr, and reinspect.

Irked by duplication

This duplication of effort irked Lockwood. He tried another way, omitting the extra two inches. "Open end hydraulic tubing is inserted into tool and clamped," he explained. "Pressure is induced from the opposite end of the tool to required pressures. Tubing is then removed and ready for issue." He was able to pressure-test up to 14,000 pounds. He uses slip-fit plugs, and these hydraulic lines fit into the aircraft without the problems that the extra two inches presented.

Lockwood has been with Grumman since 1948. With the demands of the F-14 schedule keeping Hydraulics busy, and the time he has put in at home on developing drawings to support the patent application, he hasn't had much time for leisure activities lately. Plays saxophone, however, when there's time.

Harold Lockwood
Applying for patent

Judith Porter, who works at Grumman's Stuart Facility, Plant 77, in Quality Control, hauled in a $500 award for a straightforward modification of an existing procedure in aircraft maintenance reporting. Judith, who has been with Grumman nearly three years and keeps a home and three children going, made this suggestion:

There was a new system that called for Quality Control verification personnel to use the discrepancy card, Form 77-QC-12. It required a typist to perform time-consuming research, and the department to have a separate file cabinet for the card. Then there was no feedback to Quality Assurance for discrepancy reportinig. Judith suggested a modification of the existing system using Crab Form G-125, which gave feedback (via carbon copies) to Quality Assurance. "It gives a better handle on maintenance reporting, and saves a lot of time," she said.

Judy Porter
Made a 'crab' sheet work

A surprised Jerry Ridgely was awarded $400 by the Committee for a strain gage circuit test box he designed for use during F-14 structural test. He works in Instrumentation Aircraft Test, Plant 5, and has been with Grumman nearly six years. His test box incorporates selector switches, five circuit termination plugs and connections to a wheatstone bridge meter. The finding and locating of faulty reading can be quickly analyzed, he points out, and a lot of time is saved. The Ridgelys live in Huntington Station and Jerry is putting his bonds away for sons Robert, 5, and Brian, 3.

Other awards were:

$300: Frank Mazzella, Fiberglass, Plant 27.

Jerry Ridgely
Has idea for circuit test

$225: John J. Cataldo, Equipment Engineering, Plant 30.

$200: Patsy Lamberti, QC Inspection, Plant 2.

$150: Reginald T. Farrant, Manufacturing Tooling Management, Plant 2.

$100: Ronald Collins, Requirements Planning, Plant 30; Chester Jurvsik, same dept.; Bruno J. Zawol, Inventory Control, Plant 30; Robert La Manna, Honeycomb Preparation, Plant 3; John A. Wood, Facilities Maintenance, Plant 35.

$75: Roland F. Vagoun, P/S Electronics Engineering, Plant 34; John Tiano, same dept.

$50: Wigo Brandt, General Purchasing, Plant 30; Michael Strenk, P/S Publications Supervision, Plant 34E; Thomas Toner, P/S Publications Control, Plant 34E; Evelyn Doherty, Word Process Center, Plant 5; Marilyn Schmitt, same dept.; Marilyn Kozyra, same dept.; Brenda H. Cave, Finance, Plant 55, Savannah; James J. Colwell, Machine Parts & Material Purchasing, Plant 30; Vito R. LaRocca, Measurements Standards Lab, Plant 6; James Matuza, MSC Manufacturing Shops, Plant 52, Houston; Nicholas Pravednekow, Special Tools & Methods, Plant 2; William C. Rommell, Measurements Standards Lab, Plant 12; Durward F. Underwood, Management & Administration, Plant 55, Savannah; Jerry A. Yandell, same dept.; Bart J. Verga, Die Shop, Plant 2; Henry Behrens, Jig Details & Sub-Assembly, Plant 2; Adam T. Wolynski, same dept.

Cool it!

Smoking more and enjoying it less? If you're one of those who'd like to kick the habit but can't, there may be hope in sight. Starting Monday, March 6, a "Smoke Watchers" group will meet from 5:15 to 7 p.m. each Monday for 12 weeks, says Bob Benn, who heads the Grumman Athletic Association.

There is a $4 registration fee and a weekly fee of $2.50 (a special price for Grummanites according to Benn) with a money-back guarantee if you do not stop smoking as a result of the 12-week course.

Today, Monday, February 28, a representative of "Smoke Watchers" is scheduled to be at the Plant 28 auditorium during both lunch periods to explain the program. If you cannot make this introductory meeting but are interested in attending the course, call GAA, Ext. 2133 or 2269.

Fellows get together. Last year's Engineering Masters Fellowship winners, now pursuing two-year course of studies toward degrees at local colleges, are shown with Vice President George Skurla (L) and George Breen (R), program administrator. Fellows and colleges they are attending are: (L to R) Dimitrios Maltezos, Polytechnic Institute of Brooklyn; Louis Kubat, PIB; Richard Andreano, PIB; Jon Holmes, PIB; George Yarr, PIB; Tony Tornabe, PIB; Al Zarembski, New York University; Manny Brandt, PIB; Joe Pellegrino, NYU; Dennis Henry, PIB; Nick Zervos, PIB; and Dick Manzo, PIB.

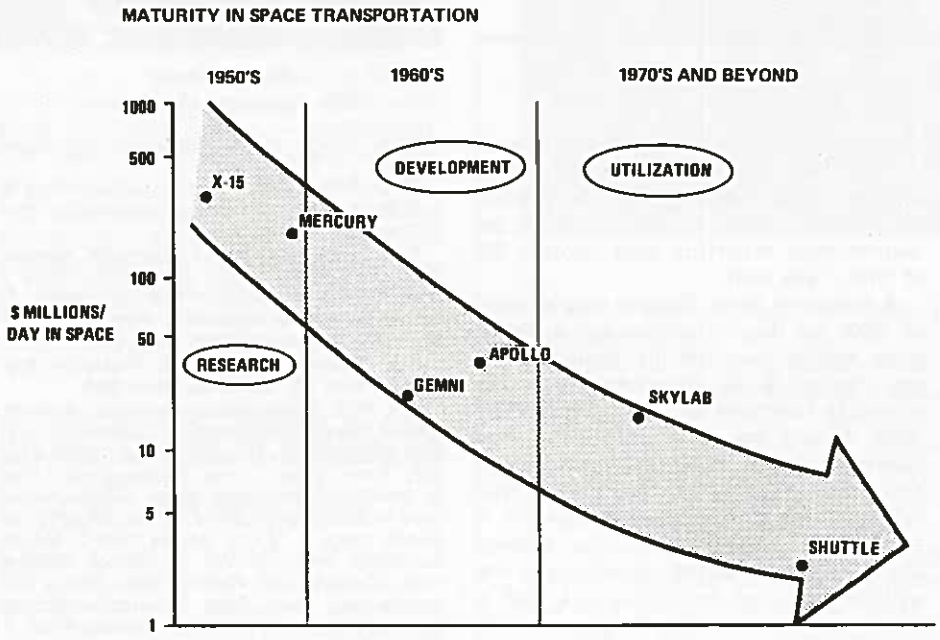
Talent, tools, and technology developed for moon flights . . .

Many remarkable events and achievements in the still-infant history of space endeavor now make it practical—technologically and economically—to devise and use a near-space transportation system called the Space Shuttle.

Without question, we have the tools.

Without question, we have systems management.

Without question, we have the experience and know-how to draw larger benefits from much less money; for through Mercury, Gemini, and Apollo—the research and exploration eras—we know the way to go, and at minimal cost. How minimal is minimal? One-tenth the cost of an Apollo mission . . . economy and utility with only a few expendables.



The story of how this has been accomplished goes back a couple of decades:

It was in the early 1950s that a small band of far-seeing people took a look at the future. In a way, they were modern Galileos, trying to discern things that were not as yet there. They could be called an advanced scientific technology group; and their reports generated a virtually imperceptible ripple on the sea of society.

"Not too many people got excited about what they were doing. Most people didn't know they existed," remarks Fred Raymes, deputy director, Space Shuttle Program.

"Modern science has imposed on humanity the necessity for wandering. Its progressive thought and its progressive technology make the transition through time, from generation to generation, a true migration into uncharted seas of adventure. The very benefit of wandering is that it is dangerous and needs skill to avert evils . . . It is the business of the future to be dangerous; and it is among the merits of science that it equips the future for its duties."
—Alfred North Whitehead

Raymes, who joined Grumman two years ago to lend a hand in the effort to win the Space Shuttle Orbiter, says that more than 90 or 95 percent of the ideas didn't get anywhere. But that was in the nature of the work. Only a small percentage of it landed in the receptive arms of practicality. Besides, there had to be time . . .

He spoke of two projects from the past, X-15 and Dinosaur. "The National Aeronautics and Space Administration (NASA), the Navy, and the Air Force were all looking into X-15, an aircraft to fly at Mach 7. And there was another one-man aircraft/spacecraft under consideration, the Air Force's Dinosaur (Mach 26)—which was in process of development at the time of Sputnik (1957). Both the X-15 and the Dinosaur were essentially reusable gliding vehicles."

One of the problems with these vehicles, as with others, was that the concept was too far ahead of the materials technology of the time. For instance: How could you fly at very high speeds (much less fly from outer space into the earth's atmosphere) without damaging the vehicle? The state of the art had not yet gone that far. (In Mercury, Gemini and Apollo, this aircraft technology was bypassed to take advantage of the ablative heat protection from the ballistic missile program.)

Sputnik provided impetus

The move was on. Despite the initial shock of Sputnik I, it's well to remember that about three months later the U. S. successfully launched Explorer I. True, it weighed just a smidgen over 18 pounds as opposed to Sputnik's 183.6 pounds, but what, legitimately, should be inferred from that? A lot, worried many Americans; and, for many reasons, the country found itself off on a new tack and the advanced planners quickly discovered their voices being heard.

As the world watched, a chimpanzee took a sub-orbital ride in a NASA Mercury capsule on January 31, 1961. Four months later, Alan Shepard flew a sub-orbital Mercury mission in a capsule designated Freedom 7. And in February of 1962, another Mercury capsule provided John Glenn Jr. the distinction of being America's first man in orbit. Then came the Gemini series, reaching farther into space, followed by the Apollo program, which—within the time scale set down by President John F. Kennedy—delivered astronauts Neil Armstrong and Ed "Buzz" Aldrin to the moon's surface.

Perhaps the world has known no more dramatic adventure.

Yet, while all these publicly reported events were going on, something else had been churning about behind the scenes. The planners, much before Armstrong stepped on our satellite, were pondering other things. For NASA it came down to a simple question: "After Apollo, what?"

Enticing possibilities

There was no lack of enticing possibilities: manned or unmanned trips to Mars . . . a fly-by squint at Mercury . . . "deep space" probes to planets beyond Mars, including even a so-called "Grand Tour" . . . construction of space stations that would include laboratories and facilities that would make "homes-away-from-home" in space feasible. The imagination boggled. Our universe was there, for the exploring. So, from Apollo, what was the next logical step? The answer:

A space transportation system, a shuttle.

Coincidentally, in February 1969, NASA asked industry for a conceptual (Phase A) study of what it then called an "Integral Launch and Reentry Vehicle." The task was to design a substantially reusable, low-cost vehicle that, in essence, could fly much as an aircraft would. It was the recommendation of the Joint NASA/Air Force Task Force to the National Aeronautics and Space Council, and hence to the President in November 1969, that the Space Shuttle should be the key feature item in the post-Apollo package.

The Task Force's summary report in May of 1969 presented clearly the need for the Shuttle and the role it should play. Some excerpts illumine the thinking:

"To support future space operations there is a critical need to reduce greatly the annual cost of routine round-trip space transportation operations, while greatly increasing the number of space flights.

"A versatile space shuttle system . . . could be the keystone to the success and growth of future space flight developments for the exploration and exploitation of near and far space."

What features should the Shuttle contain? The report broke it down into four areas:

- The lowest possible operating costs with "minimum expendables, high reuse for primary systems, on-board checkout, monitoring, fault isolation, and simplified central display systems, minimum or no systems refurbishment, minimum ground support operations;"
- A Shuttle that has an aircraft design
- An airline-style operation
- A Shuttle with versatility—multi-missions and growth potential.

Shuttle study. Bill Tappe of Advanced Technology (L) and Erick Stern (R), Systems manager, get together with Fred Raymes, deputy director of Space Shuttle Study, to define latest concepts in the program. (Photo by Fred Annette)

. . . can provide U.S. with economical Space Shuttle system

When thought of that way, the Shuttle, as well as being the immediate space transportation system, is the culmination of a cycle — one that began with Research phase (Mercury, for example), going on to Exploration with Gemini and Apollo, and now entering the Utilization phase of Space; hence the need for a low cost transportation system—the Shuttle.

At the end of the Phase A studies in November 1969, NASA decided on a fully reusable, two-stage, vertical takeoff and horizontal (aircraft-like) landing system. Its GLOW (Gross Lift Off Weight) was to be 3½ million pounds.

Down, but not out

Three months later, in February 1970, NASA issued a Request for Proposal (Phase B). Grumman submitted two designs. One was for a fully reusable two-stage vehicle. The other was a somewhat different concept that involved less technical risk and less money — just in case NASA found itself in a tight budgetary squeeze. NASA turned down both proposals, then reconsidered and awarded Grumman $4 million to study lower-cost options to the fully reusable Shuttle. (It was at this point that Grumman joined forces with Boeing, which had also been on the losing end of its proposal to NASA. Grumman would work on the Orbiter, Boeing on the Booster.)

With a view to lower-cost options, the Grumman-Boeing team boiled down three different concepts with 29 configurations to just five configurations. By December, the team converged on two configurations — a fully reusable system and suggested, in the event of limited funds, a reusable orbiter mated to an S-1C booster, as an alternative. The expendable S-1C could be phased into the reusable booster later.

At about the same time, Grumman and Boeing came up with other cost-saving ideas. One was a nearly fully reusable two-stage configuration with externally mounted hydrogen tanks on the Orbiter and a "heat sink" Booster. (Heat sink refers to a thicker shell to absorb heat, thus protecting the Booster). These changes, dubbed H33, made the vehicle simpler, lighter, and less costly; and they earned the Grumman-Boeing team an additional $1.5 million for continued design studies in May of 1970.

Change in plans

It was about this time (June 1970) that NASA was coming under increasing fiscal pressure, and its administrator, Dr. James Fletcher, decided to reevaluate the earlier decision to proceed with a fully reusable Shuttle. Grumman-Boeing, McDonnell Douglas, and North American received $2.8 million each, and Lockheed half that amount, for a four-month study of alternatives. At last September's mid-term review, the Grumman-Boeing team proposed three alternatives to the fully reusable vehicle:

- A hydrogen or hydrogen-oxygen orbiter powered by J-2 engines and launched on a reusable, winged S-1C booster with F-1 engines
- A Saturn S-1C that would permit full development of the orbiter while a new booster was phased in
- An "extended interim" system using the thrust-augmented hydrogen-oxygen tank—a system that could evolve into a two-stage system, if desired.

But the fiscal waters became even rougher and NASA had to alter the guidelines of the competing teams. To get minimum risk and lower cost, NASA suggested using existing Apollo technology and postponing more advanced technology until later.

Quickly the Grumman-Boeing team "went back to the drawing board" and came up with three alternatives: (1) a hydrogen-oxygen orbiter and reusable flyback booster; (2) a similar orbiter but with a recoverable ballistic booster; and (3) a thrust-augmented hydrogen-oxygen orbiter supplemented by two four-engined ballistic recoverable boosters. The flyback was assessed as too costly, so, last December, the Company recommended to NASA that it use the orbiter design with a hydrogen-oxygen external tank. It also recommended further study of two alternative boosters, a series ballistic recoverable booster, or a parallel solid rocket motor booster . . . which is about where things stand now.

Meeting objectives

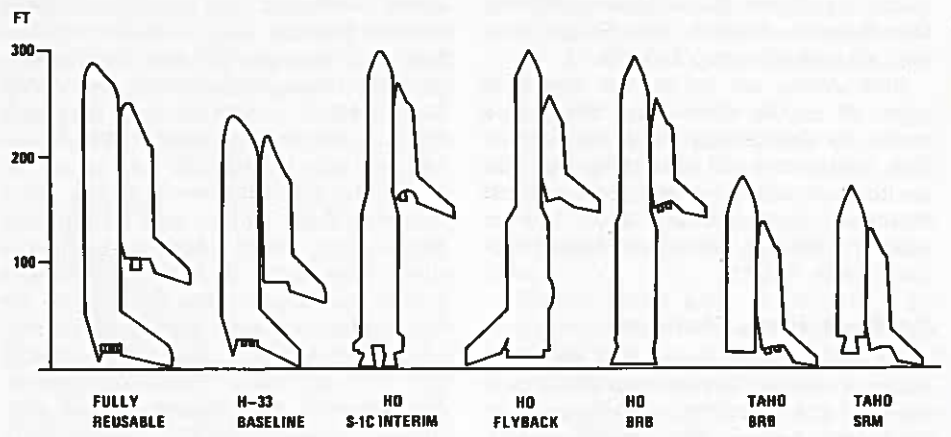
After all the iterations in design it's fair to ask: Did we succeed in identifying a space transportation system which we can afford to develop in spite of fiscal limitations? Will it reduce transportation costs to space? Raymes gave a resounding "yes" to these questions. Raymes, then said: "The cheapest manned transportation system we now have is the Saturn S-1B with Apollo—$100 million per trip. (This combination will be used to visit Skylab in 1973.) Compare this with the proposed Shuttle solution at $8 million per flight and you must admit that's somewhat less than one-tenth of the launch cost of the smaller Saturn/Apollo. That's what we set out to do—we have done it at a development cost of about 40 percent less than the original fully reusable system."

This spring, NASA will issue an RFP to prospective contractors. "This summer," Dr. Fletcher said, "we will place the Space Shuttle under contract and development work will start."

It's been a hard struggle, one in which the Company has come from behind, has pulled even with the first "primes," and feels fully qualified to build the Orbiter, largely because of the Company's extraordinary talent developed on the Lunar Module and aircraft programs and the dedication of the Shuttle team.

"It's going to take a herculean effort to make that winning proposal," says Raymes. "It's going to take the best in all of us and that's what we're giving."

SPACE SHUTTLE DESIGN COMPARISONS



Apollo 16 to orbit data recorder

A second man-made satellite will be put into orbit around the moon by the crew of Apollo 16 just before they head earthward after completing the fifth United States manned expedition to the lunar surface. Apollo 16 is scheduled to be launched from Kennedy Space Center on April 16.

The device, called a subsatellite because the moon itself is a satellite of earth, is a twin of one that was deployed by Apollo 15 last August. The Apollo 15 subsatellite is still transmitting scientific data on the lunar environment.

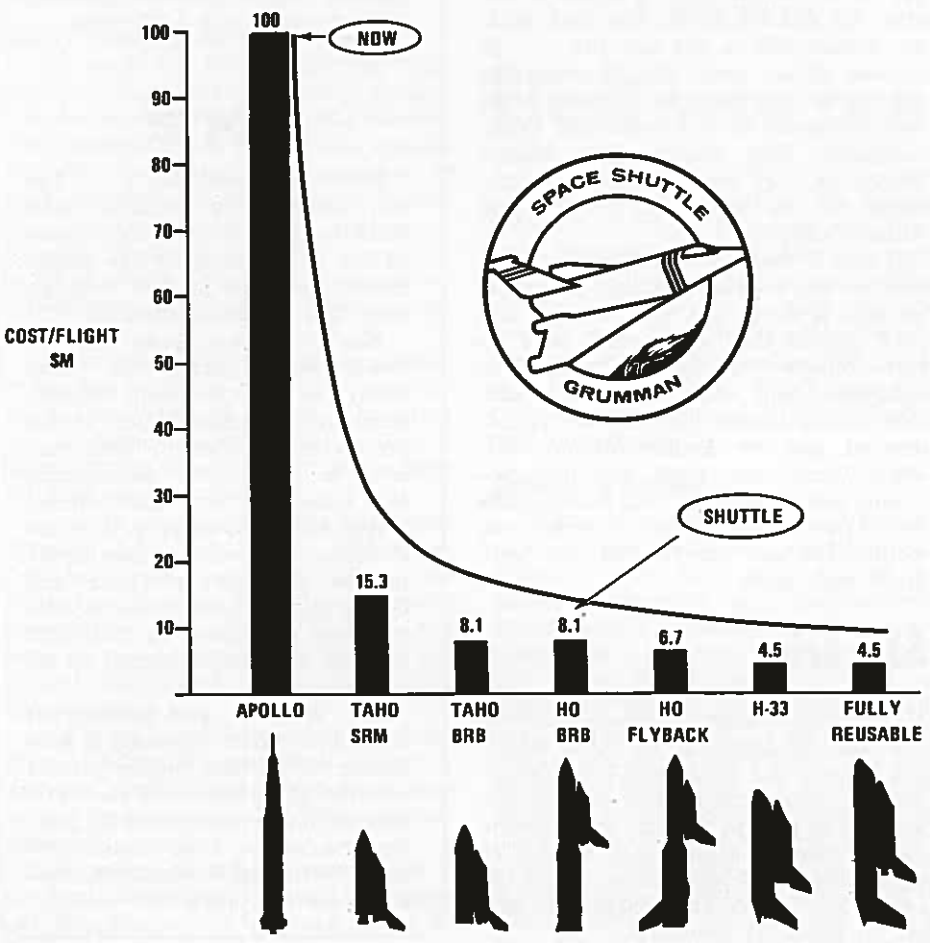
The hexagonal subsatellite is 31 inches long and 14 inches in diameter and weighs 80 pounds. It carries three experiments:

- A magnetometer to determine the strength and direction of interplanetary and earth magnetic fields in the lunar region
- An S-band transponder to detect variations in the lunar gravity field by their effect on the subsatellite's orbital motions
- A charged particles detector to measure electron and proton flux

The particles experiment package in the Apollo 16 subsatellite was damaged during testing when an altitude chamber vacuum pump seal failed and admitted air that caused electrical shorting. The damaged package and associated high-voltage circuitry are being replaced by backup equipment.

The subsatellite, which is housed in a box-like container similar to a rural mailbox, will be pushed out of the Apollo Service Module by a spring mechanism. It will go into an orbit of 63 to 86 miles above the moon.

COST PER FLIGHT



Economical transportation

Why the Space Shuttle is seen as an economical near-space transportation system is graphically shown in the illustration at left. Cost per flight of each Apollo is about $100 million—and none of the vehicle is reusable. The Shuttle—booster and orbiter—are reusable, cutting flight cost of one vehicle to one-tenth of an Apollo shot.

Stecker's 664, Angur's 258 highlight pin action

Although the Spoilers don't seem to be living up to their name in the Trader league, at least one, John Stecker, rocked somebody's boat in recent play at Oscar's in East Islip. John strung together games of 237 and 247 to finish at 664; it proved to be high for the round and the season, snapping Tom Wright's old mark by 10 sticks. Ol' Kenny John Smith was right up there with 201-237-623 to help the third-place Penny Pinchers in a near-sweep over the second-place team, the Seconds. Ken was outstanding in the previous session with 211-203-594, but high man in that action was Sid Weihs with 224-217-625. Other highlights: Herb Squire, 205-575; Dom Sansone, 212-575; Tom Wright, 214-574; Charlie Gosline, 203-572.

Stan Angur set up a new target to shoot at in the Grey loop. Stan, who works in Operations Analysis, clipped Don Anderson's old record by one pin as he shot 258 in a 604 string. Mark Mellinger fired 248-594, Jody Haynes shot 202-224-583, and Bob Mihok finished with 222-551. . . .

Kaufman leads Masters

In the Masters loop, Sid Kaufman threw a splashy 226-224-836 while Bob Herz hit 248. Al Kirillin took down both individual honors the previous week with 249-836. Other headliners: Fred Skirde, 219-808; Jack Nielsen, 240-795; Sid Smith, 225-783; Rick Sawey, 224-774; Bob Herz, 233-789; and Ed Gabriel, 200-205-206-782. . . . Frank Oczko's 214-201-603 paced the Black league in a round marked also by Walt Becher's 207-577 and Jim Richter's 210-556.

It took the Lunar league a little longer than some of the other Bethpage loops to get off the ground—and considering most of the keglers are ex-Lunar Module people, that's a little surprising—but there have been a couple of good scores to date: Lou Esposito holds the league game mark with 258 in a 592 string, while Steve Focardi used a 224 to hit 630, also tops in the circuit. . . . Art Grey livened a very quiet Black session with a record 255 in a 612 total to snap Fred Kuehne's old mark by seven sticks. Other hot shots included Jack Stephens, 205-584; Hank Froning, 211-204-570; and Wil Buck, 577. Earlier, Buck was again in the limelight, this time with 216-589, with Walt Stehlin trailing at 201-582.

Hot hand for Farrell

It could have been for Dick Farrell in the Classified league. With Bob Dudonis' 652 league mark on the line, Dick fired games of 202 and 256—but that was the extent of his bombardment as he shot a 168 and had to settle for 626. Bob Ruotolo hit 222-616 in that round, while Dudonis signed in with 235-595, Ken Warta, 202-574; and Jerry Rainford, 226-567. In the previous session, Mike Mustapich clicked off games of 214 and 215 on the way to a 598, and next in line, far, far away, was Sam Bowden with 214-228-568. . . . Rocket firings included Charlie Stumpf's 204-202-585, Early Levy's 541, Larry Schneider's 229-539, Dave Lobel's 206-534, and Fred Gregory's 538. . . . The guys in the Bethpage Nite Owl are mighty considerate of those sticks—why, in the past couple of sessions, Angelo Pomponio's 227, Harry Haase's 223, and another by Nick Loiacono were the only noteworthy scores. . . . And the Aerospace loop reports only one outstanding score, Vin Iannacone's 220-609. Other in the struggle were Dave Evans, 556; Justin Perrotta, 206-554; Clem Joie, 549.

Ed Kelly grabbed high-game honors in a past session of the Century Mixed league, but it was Bob Cozzette who made the big splash as he tacked together 211 and 213 to finish with a record 620. Grace Fraser had 198 and Karin Canonico 176, Ruth Musa, 468, and Mel Gill, 555, in that round. Later, Mark Guss' 563 and Howard Miller's 234-562 led the loop, followed by Joe Van de Wetering's 213-549, Phil Musa's 204-548; Helen Miller's 508; and Teddy Clark's 481. . . . It was Dave Struller's 575 that led the Patchogue Mixed parade, and also his 224-567 that paced the action the following week as the Good Friends (that's Norma and George and Maggie and Dave) continue to hold a slight edge in the team chase. Struller's charge has brought the Gulfstream IIs into contention, with the Mingas wedged tightly between the Good Friends and the jet stars. Other luminaries: Joan Burgess, 522; Maggie Gaynor, 538; Norma Landin, 221-511; Marty Larcombe, 201-563; Dick Lindstrom, 201-552; and Ken Becker, 550.

Too late, Grover!

Grover Hart got untracked just a little too late to make a strong run in the varsity bowling trials, but Grover now owns the Hellcat series mark as a result of his 640 in recent atcion. He finished with that total after games of 218, 202, and 220, thereby shattering Warren Foot's old standard by 14 sticks. Bud Earhart collected 227 and 201 for 610, John DiSalvo closed at 605 after 212 and 210 games, and Jack Nielsen totaled 596 on 212 and 201. . . . In Syosset Mixed play, Bill Meehan shot 235-215-607 to pace the league, while John Betterino fired 210-201-582. Other highlights: Rita Mathia, 556; Monica Wojtyniak, 537 and 545; Diane Hartmann, 500; Ed McGovern, 214-570; and Anna Wicks, 478.

It was a near-miss for Charlie Calabria in the Hawkeye Mixed league as he shot a hefty 245 but finished one stick shy of the league mark held by three others—Phil Barton, Tony Klobukowski, and Chet Everoski. Vince Crevoiserat scored 599 in that round, marked also by Emilie Alfano's 501, while Vince came right back the following session to cop string laurels with 602. Arlene Schwemmer's 522, Eleanor White's 192, and Tom Murtha's 226 were other high spots.

Ski trip

There's still time to make it! Lenox, Massachusetts, is the destination for the next ski trip sponsored by GAA, March 3-5, so you had better call Chet Baumgartner, GAA, Ext. 2133 or 2269, if you want to be part of the fun. Fee depends on how many to a room: e.g., 4-5, $47.75 each. Rental of skis, poles, boots $5 extra. You'll stay at Holiday Inn, and ski on Bousquet Mountain.

John Stecker
Cracks Trader series mark

Stan Angur
Fires 258 for Grey record

Berka back on track

It didn't take Al Berka very long to put things back in perspective. Al has been having a little trouble scoring in recent L.I. Industrial matches, but the slump seems to be over.

Berka journeyed to Rocky Hill, Connecticut, a couple of weeks ago for the Connecticut State 50-foot indoor pistol championship—and, much to Al's delight, he brought back to Long Island with him the top award in open competition. About 130 participants entered the match.

In the .22 and .45 caliber competition, Berka shot 567 and 570, respectively, for a 1,137 total.

Fore!

Don't look now, but . . . The sun seems to be shining more brightly, the thin covering of snow in the Bethpage area has disappeared (at least at this writing), why, it even seems **warmer!**

Maybe it's not quite time to swing those sticks, but Mike Cherry of the Grumman Athletic Association reminds golf league secretaries to sign in with him soon to talk about reservations this season at local golf courses.

And Mike also suggests those individuals who wish to participate in the Engineering (Blue and Gray) and Tigercat loops to contact him personally on Ext. 2133 to make sure they're signed up for season's play.

The Women's golf league, according to Eileen Toomey, is preparing for another banner year of activity at Bethpage State Park. Should you be interested in joining the league, even though you may be only a beginner, call Eileen on Ext. 3744.

Pistol squad led by Baumgarten

Mike Baumgarten fired 271 in a recent L.I. Industrial pistol match to keep the Grumman C team undefeated. — their record is 7-0—during a 995-925 victory over the Grumman E squad. Baumgarten was the kingpin of the undefeated Cs in the sharpshooter division of .22 caliber pistol competition, but he got help from Bill Rommell's 250, Tom Lovatt's 246, and Charlie Boppe's 228. Tom Tavitian's 251 was high for the losers.

Rick Wicks was another marksman in the spotlight. He shot 283 to lead the Grumman P team to a 1,075-1,001 over Kollsman in an expert division match in the L.I. league. Aiding Wicks in that win was Hank Chau's 269, Ron Trenkner's 266, and Phil Boehm's 257. The win brought the Ps all even in the loop, 4-4.

It was all bad news for the Grumman As. They lost to Brookhaven National Lab, 1,061-1,060 (Ouch! That hurt), as Dave Rice hit 276 and John Crawford 263, then the As dropped another, this one to Pan Am, 1,047-1,069. Rice fired 271 and Bob Bergeman hit 263 as the A team now shows a 3-5 record.

In other sharpshooter matches, Tom Tavitian's 260 led the Grumman E team to a victory over Indian Head; Mort Weinberg's 264 paced the Bs 997-963 win over IBM; and Joe Slattery's 244 upped the Bs mark to 6-1 in the Industrial loop while sparking a 919-901 triumph over Pan Am.

The Grumman Center Fire squad—they shoot weapons over .22 caliber—had a rough time of it, too. Al Berka scored 269, Dace Rice, 268, Mike Baumgarten, 256, and Phil Boehm, 249, in a losing match to Great Cove, 1,042-1,079. The loss dropped the squad back to .500 (3-3) in the league.

Big pin splash

The Grumman men's varsity, led by Fred Skirde, will take on the field in the L.I. Industrial men's tourney, starting this Saturday, March 4. The action starts at 8 p.m. at Mid Isle Lanes in Hempstead.

Here and there . . .

Lorry Hourihan gets a special hurrah for being the first girl in the Virginia area to complete 10 years' service with Grumman. She started with the Company in the Washington, D. C., Office, February 1, 1962. That was when Vice President Joe Bolger was in charge. Upon his retirement she worked for the present director, Vice President Cregg Coughlin. About a year ago, Lorry became Personnel secretary-receptionist at Plant 58 in Sterling, Virginia, "where I look out on the rolling plains at the foot of the Shenandoah Valley."

Named to Co-op post

Wendell Bodden of the Corporate Training and Development Department was elected vice president for programs of the Cooperative Education Association/Cooperative Education Division at a recent meeting in Cleveland. Bodden is the administrator of the Cooperative Education and High School Work/Study Programs at Grumman.

Boost for Sully

Leonard (Sully) Sullivan, who headed Advanced Systems at Grumman for some years, was sworn in February 9 as the new Principal Deputy Director of Defense Research and Engineering in the Pentagon. He succeeds Dr. Eberhardt Rechtin, who has been named Assistant DOD Secretary for Telecommunications. Sullivan has been Deputy Director for Southeast Asian Matters in DDR&E since 1966.

Radio relay team

It happened by accident. Ernie Berlucchi, an electronics engineer in Plant 25, was using his ham radio and picked up a message from—Bolivia. For him and his wife, Sophie, it was the beginning of a new kind of night life.

In short, they are relaying messages and sending radios and radio equipment to the Maryknoll missionaries not only in Bolivia but also Peru. Ernie and Sophie set up a club (now numbering some 100 people, many who are not ham radio operators) called the Maryknoll Missionary Communications Club, and since 1967 have managed to send $3,000 worth of radio equipment to the missionaries to help in their difficult job of keeping communications smooth, even in the most rugged areas.

According to Ernie and Sophie, that $3,000 is a low estimate; it could be twice that because manufacturers and distributors have given generous discounts.

Their goal? To recruit enough people to be able to help Maryknoll missionaries all over the world, not just in South America.

A little too late to remember . . . and he's broken up over it

(This is the story of how easily an accident can happen. And how it can hurt. It was told by Paul Pette of Spotweld, Plant 3, to Joe Gaigal of Corporate Safety.)

During the night, my wife rolled over onto my right foot—the one with two fractured toes. I screeched! She said she was sorry, but my foot still throbbed like "crazy." No more sleep that night.

It had all started when I put a cylindrical five-pound steel spacer on the storage shelf in the Press Department. I had placed it there, on end; maybe that would have been okay but I dislocated the spacer by nudging it with a portable vise I placed on the shelf later. The five-pound spacer rolled off the shelf, began a six-foot free fall, zeroed in on my foot—and, crunch!

Paul Pette
Ooh, it really smarts!

Good old Doc. He ministered to my broken toes. Sympathetic? You bet. What the heck. He had delivered our three kids. When I complained about the pain, he said: "If that piece of steel had hit you in the head, it would have hurt a lot less." That medical observation didn't help. It still hurt; bad.

And another thing. This accident showed me that there are a lot of "wiseguys" around. I've been called "The Compensation Case," "Gimpy," and a lot of other names I'd rather not mention. The accident has even caused me to change my driving technique. I now use just my right heel for the gas and brake. Don't worry; it's pretty safe now that I'm used to it.

You can't afford to forget. I forgot last Sunday and stepped full-weight on my toes going into church. Rather than disturb the rest of the people with my moans I went directly home. It took about four hours for the pain to subside.

Sounds pretty grim, doesn't it? I did discover there are a lot of nice people ready to help a guy though. The shoemaker near me re-engineered my right shoe to fit my bandaged foot. He extended the sole, sliced the upper, added holes on the side so that I can lace the shoe from the side. It helps.

Do you know what I've been thinking about since the accident? It might help you, too. Don't set up safety traps like I did. You could be the victim; or some other unsuspecting guy could suffer for your carelessness. When storing things on a shelf, especially heavy things, make sure they're sitting solid. And, finally, don't wait until you've had two fractured toes to think about safety shoes. Accidents do happen — so save yourself and your family a lot of grief by being prepared.

Traffic alert on materials moves

Moving hazardous material that is unlabeled or mislabeled could land you in jail, says Bill Capaldo of the Grumman Traffic Department. The packing, marking, shipping, storing, and handling of hazardous materials is carefully regulated by Federal, state, and local laws to minimize the potential danger to life and property.

Regulations vary with the characteristics of the material to be shipped, so when some types of materials—explosives, flammables, acids, corrosives, antimagnetics, etc.—are transported by land or air, they must be correctly identified so that they can be properly classified, legally labeled, and safely packed.

"It's really not that far-fetched," says Capaldo. "It could be extremely dangerous, for instance, if the Traffic Department weren't aware when it was arranging for inter-plant transportation of such materials as paint thinners, rockets (for ejection seats), and corrosives. Shipping such things on the open road or by air would be even more hazardous if they weren't packed and labeled properly.

"We're not trying to frighten people, we're just trying to keep them informed so that they can protect themselves and the Company from possible fine or imprisonment for non-compliance with established regulations."

If you're planning to move hazardous material into, out of, or within the Company, make sure you inform the Traffic or Shipping Departments exactly what you are shipping. If you're not sure of the hazard potential, call the Traffic Department, Ext. 9345 or 2496, for assistance.

And should your job require the shipment of potentially hazardous materials, call the Traffic Department for a copy of the Grumman booklet "Moving Hazardous Material."

Remember, hazardous material is a constant danger—to you and to everyone else who comes in contact with it. Don't take a chance!

Elect vice presidents . . .

(Continued from page 1)

assistant in the summer of '65. Satterfield was manager of the EA-6B Program from March '66 to June '68, then was named to direct the proposal effort on the F-14, serving in that capacity until it was submitted to the Department of Defense. In October 1968, while still in that position, Butch was also named special assistant to Board Chairman Lew Evans.

Extensive career

During 24 years in the Navy, Satterfield acquired extensive experience in Naval aviation as a pilot, and in the fields of research and development, flight testing, training, and program management. A combat veteran of WWII and Korea, Butch lists among his assignments: skipper of a Cougar squadron; commander of Fleet Gunnery School; director of the Navy's Test Pilot School at the Naval Air Test Center, Patuxent River; Training Officer for the Commander Naval Air Forces, Atlantic; member of the Flight Test panel of Advisory Group for Aeronautical Research and Development (NATO); and head of the Aviation Planning Requirements section, office of the Chief of Naval Operations.

Butch and his wife Mary and two of their five children, Lee and Tracy, live in Northport.

plane GRUMMAN news

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Ride Wanted

RTE. 111: Islip Ave. & Sunrise Hwy. to Bethpage plts. 5, 2, etc., fem. pref. 277-9822.

Swap

WHLS.: 4 new Amer. mag, nuts, locks, 15 in. w/ Goodyear poly H70x15 tires for Corfvette whls., rims, hubs w/4 whl. ltr. tires. 669-7513, evgs.

For Adoption

SCHNAUZER: Mini, fem., AKC, 2 yr. WE 1-2339.

Car Pool

CTRL. N.J.: Via Staten Isl., Belt Pkwy., So. State to Plt. 15 or nrby plts. in Bethpage. Nick Giovanos, Ext. 87471.

For Rent

APT.: Huntington, furn., bdrm., liv. rm., kit & bath, pvt. ent., patio, bsmt., heat & elec. incl., $250/ mo. HA 1-4077, after 5 p.m.

BSMT. APT.: Pvt. ent., avail. in 3 mo. JU 6-8248.

ROOM: Massapequa Pk.. furn., sep. ent. 541-5602.

SKI LODGE: Stratton/Bromley/Magic, Sun. nite thru Thurs. nite, $100. 212 428-4804.

HOUSE: Bellport, 3 bdrm., gar., fam. rm., avail. 3/1, $300/mo. 301 982-4046.

ROOM: Farmingdale, pvt. ent., share bath, woman only. MY 4-3467.

HOUSE: Bayport, 3 bdrm., 1½ bath, firepl., wash. & dry., 1 acre, $275/mo., refer. & sec. 472-1643.

Wanted

CLAM BOAT: In gd. cond. & 2 clam rakes for use in Babylon vic. 666-8967, after 5 p.m.

APT.: 3 rm. or studio w/bath, Bethpage or vic., eld. woman. 692-2738, after 5 p.m.

SAW: Radial arm or tbl., 7-10 in. dia. blade, gd. cond., reason. AN 5-7021, after 5:30.

TRAYS: Argus slide for electromatic 560 proj. 234-8310.

APT.: Nassau County, 3 or 4 rm., yg. bus. couple, approx. 7/1. 938-3943.

APT.: 1 bdrm. or sma. house, Bethpage, approx. 5/15. 822-6742.

ROOMMATE: To share spac. furn. apt. w/another male, 2 bdrm., bath, all util. incl., $87.50/mo. Art Clemente, Ext. 7735.

YEARBKS.: Aircraft, prior to '40. 929-6951, after 5 p.m.

MISC.: Johnson outbd. gas tanks, 6 or 12 gal.; elec. shift box for 40 hp Johnson elec. motor & elec. harness. 727-6441.

OUTBD.: Evinrude or Johnson, '59-'69, 50-90 hp for parts, nd. not run. 862-8503.

CAB. MAKER: Part time. 587-3877.

YOUTH BD.: In gd. cond. 587-5752.

HOUSE: Mid Suffolk, 3 bdrm., $20-$25,000, FHA. 732-9898.

For Sale

BDRM. SUITE: Blond mod. 5 pc., dbl. bd., comp., $150; highriser, $25; Hotpoint elec. wall oven, 29x21 wall open. req., $25. 261-0595.

CHEVROLET: '62 Biscayne, 6 cyl., pwr. glide, R&H, eng. nds. work, $75. 751-3015.

DUNE BUGGY: '70, grn., metal flakes, '69 eng., 8 trk. stereo & radio, 15 in. wide Lndy tires, $750. 884-6165.

TIRES: 2 Allweather G78-15 w/w, guar., $50. AM 4-3479, after 6 p.m.

AIRPLANE: Share in '63 Cessna 182, IFR equip., approx. 300 hrs., new paint & int., & gyros. 234-6546.

MOTORCYCLE: '71 Kawasaki, 350cc, street, windshld., lug., directionals, safety bars, air horns, issy bk., $850; full rac. helmet, never used, $30. 265-6606, evgs.

SAILBOAT: 18 ft. sloop w/cab., slps. 2, inbd. eng., hd., trlr., comp. o'haul. in '70, $1,675. 543-0044, after 6 p.m.

MISC.: Studio couch, $35; 30 gal. fish tank & std., equip., $35; Motorola TV, $30; G.E. port, dishwash., coppertone, $65. 581-3084.

TV ANT.: Winegard colortron, CW-96, $39. 543-2423, after 6 p.m.

SNOWBLOWER: Toro self-prop., $75. 799-5945.

For Sale

POODLES: Minis, AKC, cream/wh./apricot, $50 & up. 732-3552.

MISC.: Sears std. 1/3 hp shallow well jet pump. 12 gal. tank, $70; Roberts-Gordon gas furnace burner gun, input 150,000 BTU/hr., comp. w/valves, etc., $50. 598-1525.

PUPPIES: Germ. shep., AKC reg., 1 male, 3 fem., champ blood lines, big bones, $100 & $75. 226-3151.

RECEIVER: Lafayette 8 tube communications, 4 bands w/xtra. spkr., $25. LY 9-0557.

MISC.: Pa. House mirror, 34x47 in., candlelight cherry, $45; '61 Ford, 2-dr., 6 cyl., std., pwr. steer., nds. some repairs, $100 or best offer. MO 5-2392.

WAG.: '62 Chevy, elec. rear wind., auto., cyl., ask. $200. SU 5-8870, after 6 p.m.

STA. WAG.: '62 Falcon, 170 c.u., recent. o'haul. eng., std., new tires. 878-2169.

VW: '66 Bug, R&H, 37,000 mi., orig. owner, $700. PY 8-5785, after 6 p.m.

For Sale

BUICK: Le Sabre, 1964, white, P/S, P/B, tinted glass, $400. VA 5-7845 after 5.

DINING RM. SET: Wal. formica w/4 grn. chrs., best offer. 669-8771, after 10 p.m.

HOUSE: Roosevelt, 7 rm. col., bsmt., gar., alum. s-s, w-w, lndscpd., xtras, $25,000. FR 9-9781, after 6 p.m.

HOUSE: Waterfront, Nassau Shores/Massapequa, split, w-w, s-s, wash/dry., $44,000. 799-8089, after 5 p.m.

FURNISHINGS: Entire contents of house, Early Amer., din. rm. set, liv. rm. set & 3 bdrms., 541-2076, after 6 p.m.

FURN.: Sect. sofa, 4 pc. contemp., beige, $185; sofa chr., orange, $50. 285-5252.

BOAT: 16 ft. Glasspar, '66 55 hp Evinrude elec., '69 Shipmate trlr., '69 Navy tp., curt., B/B seats, 12 gal., xtras, $1,195. PE 1-3759.

HOUSE: Amityville, cor. 3 bdrm. col., din. rm., den, leg. apt. in bsmt., 2½ bath, dbl. gar. w/att. cottage, terr., nr. RR, $32,500. AM 4-4694.

at your SERVICE

This is a free service to Grumman personnel for non-commercial advertisements, accepted on a first-come, first-served basis. Classified advertisements are carried in PLANE NEWS only on the basis that everyone replying to such advertising will receive fair and equal consideration regardless of their race, creed, color, or national origin.
Type or print ad on form available at Employees Service and Engineering counters, and send via interplant mail to PLANE NEWS, Plant 5, Bethpage. List home phone (with area code if outside Nassau or Suffolk). Limit: one ad per person per issue. No item under $10, no firearms or ammunition.

COMET: '64 Caliente, 2-dr., 53,000 mi., auto., just tuned, nds. batt., $85. 293-9574.

MISC.: '64 Ford XL, 2-dr. hdtp., 4 new tires, 2 new snows, $200; 12 cu. ft. Frigidaire, $115; Polaroid mod. 250 camera, flash, case, xtras, $25. 473-0172.

HOUSE: Selden, nr. Smithaven Mall, 3 bdrm. front/ bk. split, 1½ bath, panel. den, half bsmt., lrg. kit/din. area, w-w, appli., fenc., lndscpd., low tax., maint. free int., $30,500. 732-5954.

HOUSE: Bethpage, 3 bdrm. ranch, eat-in-kit., din. rm., 1½ bath, fin. bsmt., air cond., wash/dry., w-w, ¼ acre, fenc., o'sz. gar., $35,990. 796-2832.

BOAT: 23 ft. Marblehead, 8 ft. beam, '57, 125 hp Palmer eng., slps. 2, hd., galley, Navy tp., side curt., new cush., carvel planked, gd. sea boat, ask. $1,400. PE 5-6474, after 5.

BOAT: 23 ft. Broadwater cab. cruiser, '64, 6 cyl., Interceptor eng., hd., slps. 4, stove, icebox, sink, din. tbl., more, $2,300. MO 9-5919.

EVINRUDE: 40 hp, '69, total elec. incl. gen., controls, used 1 season. HR 2-0581, after 6 p.m.

PROJ. KIT: Electronic, educat. Heathkit exper. set w/lessons, guides, $15. 751-1256.

VIOLIN: Child's, w/bow, $25. 587-7646, after 5 p.m.

MISC.: 2 pc. Ital. Prov. 10 ft. sofa, hot pink, 2 wh. arm chrs., all pecan wood, plastic cov., hot pink drapes, rods incl., $700. 751-6830.

FIXTURES: 40W fluorescent, w/louvers & tubes, 2 & 4 tube type, $10/ea. PY 8-6338.

WED. GOWN: Lace & silk w/detach. lg. train. sz. 9, $65. WE 8-5389.

CAB.: Wood., 35x24x68 on casters w/2 drs., shelf & hanger bar for clothes stor., $10. PE 1-7406.

SPACE HEAT.: Kerosene, pot burner, flu pipe incl., $30. AN 5-1024.

CAMERA: Yashica Mat 124 twin lens reflex 2.8, 120 & 220 film, never used. 751-1085.

MISC.: 185c.m. Kniessel (wedal) skis, marker toe & heel, lg. thong bind., $35; 220 c.m. Fisher Alu Presidents skis w/Nevada toe, step-in heel bind., $130; sz, 9 man's ski boot, Raichle lace-up, $10; port. Panasonic Nat'l. tape record., 2-spd., 3 in. reel w/mic. & monitor, $50. 751-1085.

MISC.: Bal. of 1 yr./50 visit subscript. to Jack LaLanne health spa, reason, 40 visits, $90. 226-5256.

MERCURY: '66 GT 390, Cyclone, 3-pd., new clutch, paint, & exh., $800. 586-3935.

CADILLAC: '68 Eldorado, low mi. OV 1-2126, after 4 p.m.

BDRM. SET: 5 pc. mahog., 2 hdbds., twin, nite tbl., chest-on-chest, triple dress., $400. 334-8461, evgs.

CHEVROLET: '70 Impala cust. 2-dr. sed., R&H, auto., 28,000 mi., new plugs, points, snows, new filt. & oil in auto. trans. OR 1-1417, after 6 p.m.

VW: '65 sed., orig. owner, R&H, new bks., $400. 732-3405, after 5 p.m.

FORD: '63 Galaxie, V8, 390 c.u., R&H, auto., $250. WE 5-4756.

OLDSMOBILE: '66 Delta 88, 4-dr., pwr. steer. & bks., auto., air cond., reason. WE 5-3671, after 5 p.m.

YAMAHA: '68, 2 yr., 350cc, 5-spd. trans., cust. horns, ask. $445. 483-1125.

TRAVEL TRLR.: '60 Gaucho, 15 ft., slps. 5, ask. $700. WE 5-0585, after 7 p.m.

TIRES: 2, G78-14 poly, w/w on Chevy rims, low mi., $45 or swap for 2 equiv. J78-14. 567-1537, after 6 p.m.

TIRES: 2 Goodyear 185 SR 15. JU 7-4176.

BOAT: 17 ft. Glasspar Citation, '65 Evinrude 75 hp, '70 trlr., vinyl tp., & side cov., 7 seats, xtra equip., $1,050. TU 4-0059.

POOL TBL.: 8 ft. Sears comp., 6 blt. in levelers, $120. 938-6140.

CORVETTE: '58 Chevrolet, 2 tps., new paint. & tires, orig. cond., nds. 2 dr. panels, $1,550. 293-8796.

PICKUP: '66 Ford Bronco, 4-whl. drive, 6 cyll., new snow plow, grn. & wh., new tires, bks., & batt., $1,450. 249-8284.

WAGONEER: '64 Jeep, 2-whl. drive, new motor, transmission & tires, $600. 475-1985.

POODLES: 5, AKC reg., minis, 4 male & 1 fem., reason. 747-4072.

PROPERTY: Lake Tsala Apoka, Fla., 120x120, 20mi. Gulf of Mex. 334-3715.

CORDWOOD: Split, ½ cord $15, you pick up, Smithtown area. JU 4-6206, after 6 p.m.

VW: Customized, hders, xtras. PY 6-4155, after 6 p.m.

BUICK: '64 Electra 225, 4-dr. hdtp., air cond., pwr steer. & bks., snows on rims, air bags, new bks. & tires, $500. J. Leggio, Ext. 2893.

CHEVROLET: '68 Camaro, 327 V-8, R&H, auto. 234-6546.

VW: '71, grn., 7,200 mi., R&H, $1,700. 8778-0978.

COUGAR: '68, air cond., auto., vinyl roof, pwr. str., cons., bkt. seats, 30,000 mi., $1,475. 751-3125.

HOUSE: St. James, 3 bdrm. ranch, ½ acre, wood., eat-in-kit., den, 1½ bath, din. rm., 2 car gar., w-w, s-s, tool shed, new paint. in & out, $37,500. 584-7155.

For Sale

TIRES: 2 snows, Grantmaster winter Cat 78, sz. F78x14 (7.75x14) rims & bal., 4 ply tread, 2 fbgl. belts, 2 poly ply sidewall, 2 mo., $76. 928-1043.

BATT.: Sears, 42 mo. guar., 3 wk., $22. 928-1043.

DODGE: '64 Polara, 2-dr. hdtp., 318-V-8, auto. push btn., pwr. steer., R&H, orig. owner, $475. 735-7082, after 5 p.m.

HOUSE: Setauket, 3 bdrm., 2 story col., 3 yr., 2½ bath, liv. rm. w/firepl., panel. fam. rm., w-w, quiet court, nr. 3 Vill. elem. sch., fenc. yd., playhouse, lndscpd. patio, xtras, assume high 7¼% mtge. 751-8142.

GAS RANGE: Kelvinator coppertone, 4 tp. burners, lrg. oven, broiler, clock, o'hd. hood, incl., ask. $50. 293-7888, after 4 p.m.

MISC.: Petersen twin stroller, mint grn., all xtras, $25; Storkline wax. blond birch crib w/matt. & spr., $25; car bd.; carseat w/hdrest; used playpen. Vincent Maietta, Ext. 1136.

HOUSE: S Sect. Strathmore, 1/3 acre, 4 bdrm. cape, all appli., o.h.w. heat, 2 car gar., $29,000. 751-3038.

HOUSE: Westbury, 4 bdrm., 1½ bath, carpet. liv. rm., beam. kit., 8x12 din. area, gunite pool, fenc., carport & outside stor. units. 334-3715.

HOUSE: Stony Brook, 3 bdrm. ranch, 2 bath, din. rm., liv. rm. w/firepl., lrg. eat-in-kit., util. rm., 15x21 patio w/pergola, 6 GE appli., beam. ceil., w-w, s-s, ven. blinds, 1/3 wood. acre, lndscpd., sewers, $38,000, appt. only. 751-3485, after 6 p.m.

HOUSE: Smithtown, Sunken Meadow area, 8 yr. col., 4 bdrm., 2½ bath, den w/firepl., 2 car gar., scrn. porch, fully carpet., recent. redecor., pvt. wood. cul-de-sac, 6% mtge., $45,990. 269-4386.

HOUSE: Dix Hills, sch. dist. 5, 4 bdm. hi-ranch, blt. in pool, lrg. rec. rm. w/brick firepl., undergrnd. sprink. sys., all appli., prof. lndscp., xtras, $47,000. 667-9073.

HOUSE: Rivehead, 2 stories, 3 bdrm., resid. areaa, new heat. sys., appli. 727-8710.

HOUSE: Stony Brook - Strathmore Roxbury, 3 bdrm. col., din. rm., lrg. den, 2 car gar., firepl., 1/3 ace, lndscpd., 5 appli., s-s, $37,990. 751-2719.

PROPERTY: 80x100, Central Islip, so. of LIE, nr. garden apts., sch. & shop., $5,500. HA 7-9409.

MOBILE HOME: 12x60, 3 bdrm., 1½ bath, furn., w-w, s-s, skirted. 665-6962.

LAMPS: Pr swag, lgt. cream shades w/match. tassels, antique gold trim, $45. 884-3860.

FURN.: Ethan Allen, antique wh. & prov. blue, 40 in. desk w/hutch bkcase & wh. formica tp., desk chr., nite tbl., tester hdbd. & box spr. & matt., $150. GE 3-4645.

MISC.: 2 radiator cov., 61x28x11, $10; gl. tp. dress. tbl. w/skirt, $10; set of bumpers for '62 & up Sprite or Midget; pollution ctrl. sys. for '68 & up Sprite/Midget. PY 8-4258.

HOUSE: Selden area, 3 bdrm. col. split, 1½ bath, din. rm., eat-in-kit., lrg. playrm., bsmt., gar., fenc., treed yd., xtras, $28,000. 732-5277.

HOUSE: Commack, 9 rm. col. split, 4 bdrm., 2½ bath, lrg. ctr. hall, fully carpet., firepl., bsmt., ½ acre, lndscpd., all appli., $45,000. AN 6-2294, after 6 p.m.

HOUSE: Hicksvile, 2 fam., 5 over 4, 2 car gar., 2 lrg. kit., 2 tile bath, lrg. pantry, w-w firepl., new w-w, wall panel., large ea deck, stoms, new elec., cesspoo, oi buner, bower insutation, $39,975. WE 8-3991.

HOUSE: Farmingdale, 8½ rm. split, 3 bdrm., 1 panel., eat-in-kit., din. rm., lrg. liv. rm., 2 rec. rms., 1 panel., lndry., att. gar., 2 zone, o.h.w., w-w, in-grnd. bunite pool, $45,000. CH 9-6817.

HOUSE: St. James, 3 bdrm. cust. cedar col., 1½ bath, din. rm., eat-in-kit., panel. den, bsmt., att. gar., lndscpd. xtras, $37,000. 584-7973.

HOUSE: Setauket, 4 bdrm. col., 2½ bath, din. rm., fam. rm., lndry., eat-in-kit., 2 car gar., firepl., s-s, intercom sys., full heat. bsmt., brick patio, ½ acre, wlk. to shops, 3 yr., $53,000. 751-6943.

HOUSE: Brentwood, 4 bdrm. ranch, 15x20 master bdrm., lrg. playrm., 1½ bath, carpet., o'sz. gar., above grnd. pool. 273-3651.

HOUSE: Long Bch., 4 bdrm., din. rm./liv. rm. comb., porch, lrg. patio, nr. bch., nd. heat, will take bk. mtge. w/low down pay., $16,990. HR 3-4732.

HOUSE: Bklyn, Pk. Slope sect., 8 fam. apt. house, $6,500 yr. income, tax. $900, ask. $30,000. 549-3551.

BUICK: '62 Le Sabre, 4-dr. sed., 4 new tires, V-8 auto., new gen., reg., & bks., & master cyl., $100. WE 5-6378.

BUICK: '65 Skylark conv., new bks., tune up, top., pwr. steer., $550. 731-7198, after 5:30.

For Sale

SAILBOAT: 12 ft. fbgl., dacron sail w/cov. & trlr., $450. 724-6441.

HYDROPLANE: 14 ft. boat, mahog., 50 hp Merc. outbd., trlr., xtras, $550. 981-0123.

SAILBOAT: 18 ft. sloop w/cab., slps. 2, inbd., hd., comp. o'haul. in '70, trlr., $1,675. 543-0044, after 6 p.m.

SAILBOAT: '70 O'Day "Mariner 2+2," 20 ft., C/B sloop, comp. cust. & equip. for class assoc. rac. or cruising, '71 Evinrude 6 hp outbd., '71 NYS insp. hd., Rolly Tasker sails, Telo battens, Harken blocks, tanks, run. lgts., fend., line, anchor & rode, winter cov., '70 Holclaw trlr., $4,000. 543-1931.

MOTOR: 18 hp Evinrude outbd., aask. $250. 212 VI 7-4349.

BUICK: '68 Skylark cust., auto., air cond., pwr. steer. & bks., vinyl tp., 350 V-8, ask. $1,650. 364-1332, evgs.

BIKE: 20 in., boy's, banana seat, hi hndl. bars; 3-spd. port. record play., dual stylus, 2-spkrs. 221-8776, after 4 p.m.

EXCERCYCLE: 2-spd. motor, all bdy action, $300. WE 8-2126.

ICE SKATES: Girl's Reidel, sz. 13½, $15. CH 9-4670.

HD. SKIS: 208cm, mod. 720, no bind. mtg. holes, never used, $65. LI 1-8590.

GS SKIS: Spalding alum., 210cm w/Salomon 505 step-in bind., $100. 671-4083.

STA. WAG.: '71 Opel, low mi., R&H, wh. ext., red. int., std. 4 on fl., best offer. 286-0142, bet. 9-5 p.m.

MUSTANG: '67, 2-dr. hdtp., V-8 auto., $974, 286-3363.

MOTORCYCLE: '71 Kawaski, 350cc, 2,000 mi., gar., orig. owner, ask. $775. JU 8-0838.

HOUSE: Selden, 4 bdrm. split, 1½ bath, w-w, s-s, xtras, $27,000. 473-1854.

HOUSE: W. Babylon, 7 rm., 4 bdrm. cape, full bsmt., (½ fin.) att. gar. & patio, s-s, lndscpd. corner plot, $29,500. 884-7111, after 4 p.m.

HOUSE: Bayport, 6 rm. cust. ranch, att. gar. & breezeway, ½ acre, fin. bsmt., new refrig., wash., & dry., air cond., cust. carpet., Carasten new thruout, xtras, $40,000. HR 2-2256.

HOUSE: Amity Harbor, 3 bdrm. brick cape, on canal, bulkhd., 8 yr., $33,000. 421-1144.

HOUSE: Commack, 3 bdrm., din. rm., eat-in-kit., s-s, gar., fenc., ¼ acre, fin. bsmt. w/poss. 4th bdrm., carpet. & appli., xtras, 5¼% mtge. take-over avail., nr. pkwys., ask. $33,990. 543-4116.

HOUSE: Massapequa, mother/daughter cust. ranch, 3 bdrm. up w/wood burn. brick firepl., 2 add. bdrm. apt. down w/sep. ent., bath & kit., avail. for rent, all brick, 100x100 fully lndscpd., unatt. tool shed, take over $16,000, 6% mtge., $36,000. 799-8788.

MISC.: Bachelor chest, 4 dwrs., desk tp., maple, $20; '65 Mercury Pk. Lane, 2-dr. hdtp., $550; 9x15 continental style tent, 1 yr., sewn-in-fl., 5 scrn. wind., canopy front, dbl. zip, slps. 6, stor. bag, $65. JU 4-6387.

CAMARO: '67 conv., 7 cyl., stick shift, Michelin-X radial tires, new rear wind., $1,100. 543-2593.

MISC.: '59 Corvette hdtp., hi-perf. 427 c.i.d. w/ manual torqueflite, Edelbrock, Holley, Vertex, Jardine, Art Carr, S-W, Crower, etc., under 500 mi. on motor, $2,000; Drag parts, 2 ea. 10.65x15 M&H slicks, 10 in. wide XS-11-1 compound, mtd. w/tubes on Chevy chrome reverse whls., new, $150; 1 ea. same as above, $40; pre '64 Chevy gears, 5.13 w/posi, $85, will swap gears for 3.70 equiv. & $50. 269-6928.

TRAVEL TRLR.: '69 Shasta, 15 ft., twin tanks, refrig., TV ant., spare, slps. 6, 3 burner stove w/oven, $1,425. 785-2663.

ENG.: Pontiac, 326 c.i., 285 hp, 4-bbl., recent o'haul., all new gaskets, dual exh., rad. & batt. incl., $125; other parts for '64 Tempest conv. avail., rear wind., etc. 581-5328.

TIRE RIMS: 2 new, sz. 14, $10. 731-6097.

HOUSE: Seaford, 4 bdrm. cape, low tax, dead-end st., oak & birch trees, hand crafted cust. col. int., panel., timbers, beams & beam sid., cust. Early Amer. kit. & bath, walk. to 3 hop. ctrs., principals only. 221-3452.

LAWN EDGER: Gas eng., Craftsman, $15 724-2756.

RECORDS: 151, 78 RPM, GlennMiller, etc., 10, 45s, 3, 15 in. records, $20. 727-7414.

KODAK: Auto. 35mm, blt. in lgt. meter w/case & flash attach, oper. man. or auto., $35. 585-8998.

RD. RUNNER: '70, blue w/blk. int., pwr. steer., 4-spd., lgt. group, 383 c.i., posi rear, perf. hd. paint, radio w/spkrs., front & rear, steel rd. whls., F70x14 polys, hvy. dty. sus., ak. $1,700. 676-8732, after 6 p.m.

Congrats. Art Melrose (L), Plant 77 manager, Vice President Jim Zusi (2nd R), and course instructor Ed Denzler (R) were on hand to present certificates to Conrad Patterson, John Schneider, and Ron Hevner upon their completion of 12-week evening course on Management Fundamentals at Indian River Community College.

For Sale

MISC.: '64 VW eng., 40 hp, comp., rebit. & intall., $160; rgt. & left front end assem. for '57-'65. 273-6239.

BOAT: '67 Sportcraft, 17 ft. w/B/B seats, 40 hp Johnson elec., '67 Shipmate trlr., xtras, $1,200. MO 1-4311.

TV: 16 in. Magnavox; 20 in. Philco. FR 9-2083, after 5 p.m.

TAPE DECK: Stereo AKAI mod. 360D, prof. equip. 727-7831.

TBL.: Ping pong, $20. 212 LI 4-4780.

BOAT: 25 ft. Owens, rebit. 225 hp eng., 60 hr., slps. 5, hd., galley, xtras, $2,500. CH 9-3294.

RAC. BOAT: 12 ft., 25 hp Evinrude, 2 tanks, elec. start., xtras, ask. $395. 273-4115.

SAILBOAT: 19 ft. Lightning, #8237, wood, dry sail., Seidelmann main & jib, trlr., $1,400. 757-7818, evgs.

SAILBOAT: 17 ft. fbgl. Thistle 1460, sloop w/ alum. mast, full rac. equip., sails & trlr., $1,275; new North main & jib, $150. 289-4863.

SLOOP: 25 ft. Pearson Cmdr., fbgl., slps. 4, equip., $5,900. 261-1186.

EXP. CRUISER: '63 Owens, 28 ft., slps. 4, 185 hp, hd., 110w S/S, press. water, depth find., dacron bk. cov., fit. winter cov., fully equip. 423-2752.

MISC.: 16 ft. boat 4/75 hp outbd., elec., trlr. & access., $600; formica dinette w/buffet & china, $200; Deming well pump w/access., $30; ham radio equip., mobile & fix. sta. 796-0617, after 6 p.m.

BOAT PROP.: Left & rgt., 19x20, 1¼ bore, $60. HA 7-6930.

CAMERA: 35mm, Leica M-s, 50mm f.2 Summicron lens, $225. PE 1-1839.

CAMERA: Honeywell Spotmatic Pentax, f1.4, 35mm, reflex, thru lens lgt. meter. sys., incl. 135mm telephoto lens, wide angle lens, 2X extender, strobe flash unit, tripod, case, bag, asst. filt., comp. et-up, $375. 727-7831.

CAMERA: Rolleicord IV camera, Weston Master II meter, Kalart flash, filt., lens shade, access., $75. WE 8-1869.

PHOTO EQUIP.: Nikon F bdy. w/photomic find., $160; Nikon bellows attach., mod. 11, $35; slide copy. attach., $12; elect. ring lgt., 52mm adapter, etc., $35; lens, reverse ring, etc. SU 5-1878, after 6:30.

CAMERA: Bolex H-16, pan cinor zoom lens, filt., lea. case, $450. 864-3134.

CAMERA: Polaroid mod. 210, lea. case, 2 yr., never used, $40. 665-7690.

CLOCK: Grandfather by Trend clocks. WE 1-4223, after 5 p.m.

TREES: Colorado blue spruce, Norway spruce, silver fir, yews, 4 yr. seedlings. 281-2678.

TYPEWRITER: Smith Corona elec. port., 2 yr., $80. AM 4-2116.

STEREO: Motorola cons., record changer, AM/FM radio, $50. MO 1-2460.

TAPE RECORD.: VM, records & plays stereo, $125. 862-8503.

HUMIDIFIER: Presto 10-gal. fbgl. tank, auto. cont., $35. 667-0219.

For Sale

FURNACE: Bryant gas fired, gd. for 4 or 5 rm., summer or winter bungalow, 3 yr., $125. CA 1-8219.

CERAMIC MOLDS: By Atlantic, Holland, Duncan, Whitehorse & others. 543-4116.

LABRADOR RETRIEVER: AKC reg., reason. TU 4-1189.

PUPS: Poodle, AKC, mini, cream/wh. apricot, $50 & up. 732-3552.

POOL: 4x18, blue liner, wood ladder, 4 sun decks, steel posts, filt., vac., skim. nets, chlorine, 2 yr., $175. RO 4-1510, after 5 p.m.

PONTIAC: '68 LeMans, drk. grn., 2-dr., 6 cyl., std., 27,000 mi., 6 new tires, $1,300. RA 8-6334.

PLYMOUTH: '68 Fury III, 2-dr., vinyl roof, air cond., pwr. steer. & bks., AM/FM, $1,250. PE 1-7008.

BUS: '70 VW, o'34,000 mi., $2,550. 273-2539.

OLDS.: '66, 4-dr. sed., auto., pwr. steer. & bks., air cond., $600. 473-6681.

PLYMOUTH: '71 sport sub. 9 pass. wag., 383 c.i., 4-bbl., pwr. steer. & disc bks., air cond., hvy. tdy., trlr. pkg., rear pkr., 9,500 mi., remain. 3 mo. fact. warr., $3,190. AN 5-2196.

OLDS.: '69, 98 lux. hdtp., full pwr., under 50,000 mi., ask. $2,250. 864-6842.

AUSTIN HEALEY: '61 Sprite bugeye, recent paint, new int., start. & fuel pump, wood whl., best offer o'$550. 884-9890.

FIREBIRD: '68, auto., 350 c.i.d., pwr. steer. & bks., rear spkr., snows, grn., blk. vinyl tp., $1,200. AN 5-0658, evgs.

CHEVROLET: '66, 2-dr. Bel Air sed., auto., $475. 938-2444.

For Sale

WAG.: '68 Ford LTD country squire, 390, pwr. steer., 10 pass., blue, 40,000 mi., $1,700. 293-5403.

OLDS.: '61, V-8, 88, 4-dr., pwr. steer. & bks., 4 new tires, R&H, $125. 643-9615.

CUTLASS: '70, 4-dr. sed., air cond., pwr. steer., vinyl roof. 261-1186.

CHEVROLET: '68 Caprice, vinyl tp., new bks. & tires, orig. owner, $1,395. 543-8795, after 6 p.m.

BUICK: '69 LeSabre, 4-dr. cust. hdtp., vinyl roof, air cond., pwr. steer. & bks. 541-3411.

MAVERICK: '70, std., 6 cyl., red/blk. int., R&H, 14 in. tires, 30,000 mi., $1,150. 475-0880.

DIN. RM. SET: Trad., 60 in. breakfront, 60 in. tbl. w/leaf & 6 chrs., pads, $450. 587-3899.

DIN. RM. SET: Buffet, hang. wall hutch, contemp. wal. fin. by Dekor, $350. OV 1-7469.

DIN. RM. SET: Mod., blond, hutch, tbl., 4 chrs. 543-7097.

MISC.: Mod. liv. rm. chr., brown nylon; baby access., playpen & carr. 234-1052.

WALL SHELVES: Spanish, cust., install. 589-8171, evgs.

MISC.: Childcraft crib, Ital. prov., wal. fin., ask. $20; blonde fall, 100% human hair, w.case, $10. 694-5622.

TV: 21 in. RCA, blk & wh., $10. OV 1-7381.

ANALYZER: TV, B&K, 1076, $225. 868-1389.

BABY CRIB: Wh. w/new matt., $25. 667-0219.

BABY FURN.: Lullaby wh. prov. canopy crib & match. dbl. dress.; Bilt-rite Pk. Ave. navy blue coach carr. 669-9022.

OBITUARIES

Plane News has received word that death has come to the Grumman personnel listed below. We extend sincere sympathy to relatives and friends.

MAX L. SCHOCK, Support Plans & Proposals, Plant 34, died February 12. He was 52 years old and had been with Grumman since 1965. He lived at 81 Cairo St., Huntington.

WALTER LABZDA died February 14 at the age of 52. He worked in Product Release & Analysis, Plant 27 and had been with Grumman nearly 14 years. His home was at 85 Moody St., Islip.

PARKER L. DEEL of Plant 58 Management & Control died February 11 at the age of 38. He had been with the Company since 1968 and lived at 10916 Oakwood Dr., Fairfax, Va.

JOSEPH J. BERNARD JR. of Plexiglass, Plant 27, died February 15 at the age of 56. He had been with Grumman 18 years. His home was at 11A Hickory St., Central Islip.

FRANK J. MELODY of the Warehouse, Plant 17, died February 16 at 55 years of age. He had been with Grumman for 28 years and lived at 26 Grape Lane, Hicksville.

WILLIAM NUNEMAKER of Parts Paint, Plant 2, died January 21 at 46 years of age. He had been with Grumman 10 years and lived at 54 Spruce Ave., Bethpage.

JAMES G. COLLINS of Grumman Data Systems, Plant 5, died February 20. He was 52 and had been with Grumman since 1959. He lived at 3101 Xavier Pl., Oceanside.

ALFRED H. COTE of Machined Parts/ Material, Plant 30, died February 21 at the age of 64. He lived at 607 Spuhler Pl., Uniondale. He had been with the Company since 1940.

Aim for 100 percent participation in GAA membership drive

Quick now, what's the only commodity you know of that hasn't changed its price in more than 20 years yet still gives the same (maybe more?) service than when it was first established?

What's that you say, you're somewhat dubious that **anything** could remain at the same price these days? That's understandable. But to prove a point, check in your desk drawer or your wallet, haul out that ticket stub marked GAA, and—VOILA!—you've found it, the only fixed-price commodity anywhere.

Starting this Wednesday, March 1, you'll be getting another chance to buy a Grumman Athletic Association membership ticket. That's when GAA starts its month-long member drive. And at $1 a ticket, it's really a bargain. Where else can you be introduced to participation in clubs, tours, sports, and . . . well, you name it, for such a low, low introductory offer?

It's a real fiscal find! To prove it, GAA is once again offering a total of 65 prizes to lucky ticket holders at the conclusion of the drive. The top 15 winners will get color Polaroid Land Cameras (Model 440), while 50 more can count on a set of Grumman glasses.

Quite a deal!

In a couple of days, a representative from your department will be around to ask you to participate in the 1972 GAA membership drive—and if no one does, why not turn it around and go ask for one. Here's what you get for your buck:

- Hobby, art, photography, and flower shows
- Intramural basketball, softball, pocket billiards, bowling, men's and women's golf, tennis, paddle ball
- Reduced prices for foreign flights and professional games
- Lunch-time activities such as handball, softball, chess, and ping pong

Then there are the clubs sanctioned by GAA and open to everyone at Grumman. Included on the list: Antique & Sports Car Club, Aquatic Club, Astronomical Society, Coin Club, Engineering Model (Plane) Society, Ex-Service Men's Club, Garden Forum, Pure Breed Dog Club, Amateur Radio Club, Horseback Riding Club, Rod & Gun Club. The list seemingly goes on and on . . . and if the activity you prefer doesn't appear here, why not call the GAA, Ext. 2133? If enough people agree with you, it's more than likely that you can start up—with GAA sanction — a club to suit your taste.

Company sponsors varsities

There are a couple of things your bucks don't support: Company-sponsored varsity teams such as the basketball, bowling, golf, and soccer squads. As Mike Cherry, who heads the GAA drive effort, puts it: "We're looking for 100 percent participation this year, and we're going to try like hell to get it. Remember, not a single dollar of membership funds goes toward the support of any varsity team. That's a guarantee!

"We in GAA are trying to offer a well-rounded, interesting, and year-round recreation program for Grummanites," says Mike. "But to be able to achieve that goal, we have to have your cooperation—and your dollars."

So, it's really very simple. Buy a $1 membership ticket; fill out the attached stub completely and return it to your department's representative. The stub will then be returned to the GAA office in Plant 28B where it will go with thousands of others from around the Company to await the GAA prize drawing on Friday, April 7.

Of course, the Company chips in toward the GAA fund to help keep it financially sound, but when you come right down to it, your dollar and those of all your fellow Grummanites provide what's really needed: financial and moral support for an on-going program established for the benefit of all Grummanites.

Why wait? Add your support to the GAA drive by purchasing your $1 membership ticket. And if you have further questions, call Mike Cherry on Ext. 2133 or 2269. He'll be glad to elaborate.

Bargain hunter. President Bill Zarkowsky, a sometime golfer like many of us, shows he knows a bargain when he sees one. Here he purchases the first 1972 GAA ticket from campaign director Mike Cherry. (Photo by Harry Prodromides)

Skirde heads trials for pin varsity

Though Fred Skirde dipped to 516 in the final three-game session, he still finished first in the rolloffs to determine the Grumman varsity for the L.I. Industrial men's tournament. Skirde had fired 247-246-650 in an earlier round to take a commanding lead in the trials, and despite his late slump, closed with a 5,271 total for 27 games—an average of 195.

Nick Malandro was second in the rolloffs with a 5,227 total, and showed a 233-638 in the fourth round, while Dave Evans cashed in games of 211 and 212 for a 622 string in the final session. The splurge carried him past a few of the contenders whose efforts slipped in the finale, enabling him to close at 5,116. Ernie Jenkins used a 235-591 to good advantage, finishing fourth with 5,095, with Ben Plawski rounding out the starting five as he totaled 5,090 for 27 games.

Available for part-time duty if they are needed are Bob Kohlhoff, 5,082; Herb Mahoney, 5,065; Frank Tucholski, 5,040; George Fowler and Don Vazquez, 5,011.

On camera. Has a Polaroid color Land Camera ever looked so good? Not likely, unless it, too, had such attractive demonstrators as Mary Casiglia (L) of the LM Program, Plant 25, and Jessie Williams of F-14 Structural Test, Plant 5. The Polaroid is one of 15 automatic cameras and 50 sets of Grumman glasses being offered to lucky ticket holders by GAA during their annual membership drive. (Photo by Bob Settles)

Saga in a Grumman canoe

"Fritz Sprandel doesn't give up easily," according to a little story in "Bahama," a newsy leaflet published to promote Great Exuma Island in the Bahamas. Sprandel, it seems, is on his way from New York to Los Angeles by Grumman 17-foot canoe. He has had adventures, he said, as he relaxed and took on supplies at Rolleville, Great Exuma.

His adventures, August to November, 1970: Long Island, New York, to Key West, Florida. In November, a severe storm in the Gulf of Mexico caused him to lose his canoe and equipment.

May to July, 1971: Returning to Key West with a new Grumman canoe and supplies, he again headed for the Yucatan area. "This time, instead of a storm, he was met with a calm. Unable to make headway against the Gulf's powerful current, he was swept into Cuban waters, beaching his canoe 200 miles east of Havana. For 45 days he was held as a revolutionary by Cuban authorities and, in July, was exchanged for four Cuban fishermen.

"October 1971 to the present: The Swiss Embassy in Cuba negotiated the return of Mr. Sprandel's canoe and supplies and shipped it to Nassau, where, on November 30th, Mr. Sprandel struck out for Los Angeles once again, stopping at Rolleville on December 1st.

"He is now canoeing down the Bahama Islands chain to Haiti and Puerto Rico, then on to the Panama Canal (toll: $1.72) and north to Los Angeles."